Chapter 6

Why Do Pro Athletes Make So Much Money?

No rational person can view what's going on in baseball and not have concerns.

—Fay Vincent
Commissioner of Baseball

It will take a club to go belly up in order to stop this madness.

—Dave Dombrowski
Montreal Expos General Manager

HUGH DUFFY played in the major leagues from 1888 through 1906. In 1894, while with Boston, he led the National League in batting (.438), hits (236), home runs (18), and runs batted in (145). The following year, he became baseball's first famous holdout. The owners, Boston's legendary, penny-pinching "Triumvir," finally capitulated, agreeing to a $12.50 per month increase in Duffy's salary. However, Duffy was required to assume the duties of team captain, including responsibility for team equipment. In 1895, Duffy's raise evaporated when the team lost equipment worth more than his salary increase.

Contrary to a generally held perception that players were pretty sedentary in the "good old days," Duffy was one of many baseball stars of his era who jumped their contracts whenever rival leagues appeared to challenge existing leagues. Duffy jumped from the Chicago NL team to the Chicago Players League entry in 1890, spent a year in the American Association, and then returned to the National League. In 1901, he left the Boston NL team to join Milwaukee of the American League before ending his career as manager of the Phillies in 1906.

In *The Hustler's Handbook*, Bill Veeck tells of coming across the long-lost accounting records of Charles Comiskey's 1919 "Black Sox," after Veeck had bought the White Sox in 1959. He discovered that Comiskey was every bit as tight-fisted as the Triumvir, leading Veeck to refer to Comiskey as the "cheapest skate in town." In the end, Comiskey's closeness with a buck was his team's undoing. For example, "Shoeless Joe" Jackson, a 10-year veteran with the second-highest lifetime batting average in the history of baseball, hit .354 in 1918 and earned $6,000 ($46,000 in 1991 dollars) in 1919. Eddie Cicotte, with 13 years in the majors, won 29 games in 1919 and was paid $7,000 ($55,000 in 1991 dollars). Buck Weaver, a .300-hitting third baseman in 1919, earned the same amount as Jackson. These salary figures, modest even for the times, applied to one of the best young players in the league (Weaver), along with two players (Jackson and Cicotte) who would have been lead-pipe cinches for the Hall of Fame had it not been for the 1919 Black Sox scandal. All three were banned from baseball for life for their involvement in the conspiracy to throw the 1919 World Series. Cicotte turned out to be the leader of the conspiracy, Jackson was a reluctant fellow traveler, and Weaver went to his grave claiming that he had nothing to do with the plot.

Anecdotal evidence like this suggests that in the distant past, salaries in professional sports, while far above blue-collar wage levels, were still moderate. For a more recent period, complete salary information for all baseball teams over the years 1952 through 1956 were compiled in the late 1950s during a congressional investigation into the antitrust status of pro sports. These team salary figures are show in Table 6.1. Entries are given in 1991 dollars for comparison purposes.

Even in the early 1950s, baseball salaries averaged only in the $67,000 to $74,000 range (in 1991 dollars), or around the $14,000 mark in current (early 1950s) dollars. The minimum wage in baseball in 1954 was a mere $6,000 ($30,100 in 1991 dollars). Table 6.1 provides some solace for the long-suffering Pittsburgh fans of the 1950s, since those Pirate players got paid pretty much what they deserved. On the other hand, it is surprising to find that the Yankees were winning all those pennants under the management of Casey Stengel with payrolls generally less than the amount Cleveland paid its players. The data in Table 6.1 lend additional support to the common perception that players' salaries back in the "good old days" generally were not outrageously high.

My, how times have changed. In the spring of 1991, at the age of 28, Boston Red Sox pitcher Roger Clemens became the highest-paid player in baseball history, with a four-year contract, beginning in 1992, worth $21.5 million. His package totaled $400,000 more than Doubleday and Co. paid for the New York Mets in 1980, a record price in its day. By

Table 6.1
Average Baseball Salaries by Team, 1952–1956 (1991 dollars)

Team	Average Salary per Player				
	1952	*1953*	*1954*	*1955*	*1956*
NATIONAL LEAGUE					
Brooklyn	73,065	78,096	88,891	83,968	93,984
Chicago	53,751	82,051	72,884	61,233	56,450
Cincinnati	52,014	49,850	47,717	55,423	60,830
Boston/Milwaukee	61,977	59,282	75,049	87,606	87,414
New York	88,495	85,905	72,180	86,494	78,950
Philadelphia	64,737	67,852	70,267	72,803	81,439
Pittsburgh	60,700	42,040	45,502	44,561	49,481
St. Louis	80,729	79,414	80,183	70,529	80,692
Avg. (1991 dollars)	66,934	68,061	69,084	70,327	73,618
Avg. (current dollars)	13,100	13,421	13,725	13,290	14,789
AMERICAN LEAGUE					
Boston	80,525	79,820	74,596	71,792	77,606
Chicago	58,707	70,489	82,146	87,000	87,214
Cleveland	90,539	95,287	90,804	114,585	92,191
Detroit	74,700	68,004	61,006	61,435	72,031
New York	82,722	85,500	95,082	79,977	87,462
Philadelphia/ Kansas City	59,831	60,093	51,694	57,747	59,984
St. Louis/Baltimore	53,401	61,817	57,130	54,716	55,653
Washington	58,401	60,600	60,502	58,101	48,684
Avg. (1991 dollars)	69,884	72,701	71,620	73,169	72,603
Avg. (current dollars)	13,678	14,336	14,229	14,483	14,585

December 1991, Bobby Bonilla had signed with the Mets for even more than Clemens—$29 million over five years—and in early 1992 Ryne Sandberg's package totaled around $30 million for four years! In the NBA in 1991, Patrick Ewing fought a losing battle with the Knicks to extricate himself from a contract paying a mere $14.2 million (plus bonuses) for four years. Even in the NFL and the NHL, traditionally the lowest-paying leagues, million-dollar-per-year contracts have become commonplace.

In this chapter, we try to answer the burning question: How can it possibly be that pro athletes like Clemens, Bonilla, Sandberg, and Ewing make so much money? This takes us into the workings of the player market under free agency and under a reserve clause system, and the relationship between salaries and ticket prices is also discussed. The main focus of the chapter is on major league baseball, and on modeling

the process that determines salaries in that sport. We identify the variables that are the best predictors of baseball salaries in the free agency markets of the late 1980s and early 1990s. Among other things, this approach can be used to provide evidence of owner collusion in the 1986 baseball free agent market. It also can be used to estimate the value of free agency to players in the late 1980s; in turn, these estimates imply that salary increases in the recent past reflect demand-side forces operating in the salary market, rather than supply-side forces.

Finally, the salary distribution in pro sports is examined. In baseball, it turns out that salaries have become less equally distributed over time, and dramatically so following the demise of the reserve clause. In a comparison across sports, what limited data there are suggest that major league baseball has the most unequal distribution of salaries of the four major sports, followed by NBA basketball, and then the NFL, with the NHL having the most equal salary distribution.

Pro Athletes as Entertainers

Figure 6.1 documents the rise in average salaries in the four pro team sports over the past few years, in real (1991 dollars) terms. Prior to the appearance of player unions in the 1970s, salary information was avail-

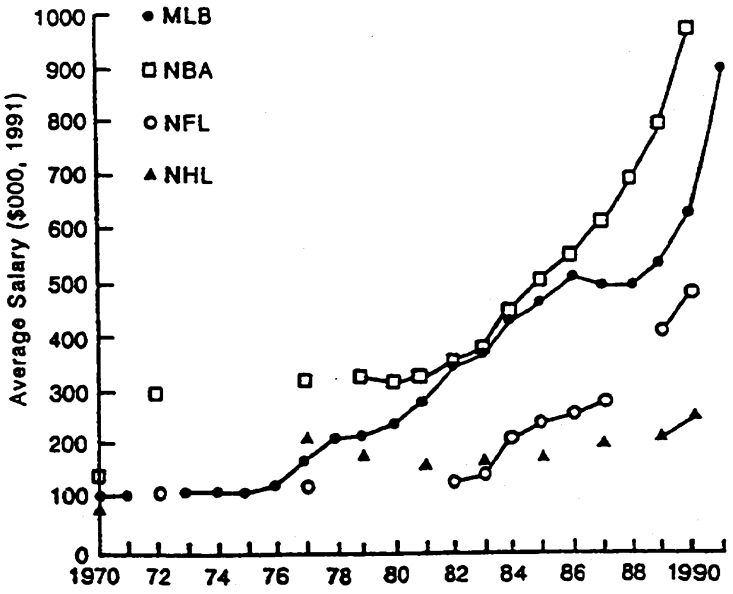

Figure 6.1 Average Salaries in Pro Sports, 1970–1991

able only to owners, except for scattered data collected during congressional hearings, so detailed comparisons with earlier periods are not possible. Unlike unions in most industries, players' unions do not negotiate "standard wage" policies binding on most or all members. Instead, individual player salaries are determined by direct negotiation between the player and the team owner. Unions do bargain for league-wide minimum salaries, so the changes over time in minimum salaries reflect in part changes in the bargaining power of unions. Figure 6.2 shows the rise in minimum salaries over roughly the same time period for baseball and basketball (again, in 1991 dollars), the two sports where data are sufficient to allow comparisons.

Returning to Figure 6.1, the graph charts an explosive growth in player salaries in both baseball and basketball over the past 15 years or so, to the point where the average salary in major league baseball in 1991 was $851,000. Interestingly, there was a lull in the rise of baseball salaries (but not in basketball) over the 1986 through 1989 period. Since the owners were found guilty in 1989 of colluding to restrict the movement of free agents in 1986 and 1987, this lull should come as no surprise.

While average salary levels are much lower for football and hockey, football (and, to a lesser extent, hockey) also showed marked increases in real salary levels in the 1980s, despite the restrictions on player mobility (free agency) for NFL football relative to baseball and basketball. Thus, in rounding up the usual suspects to explain the real growth in

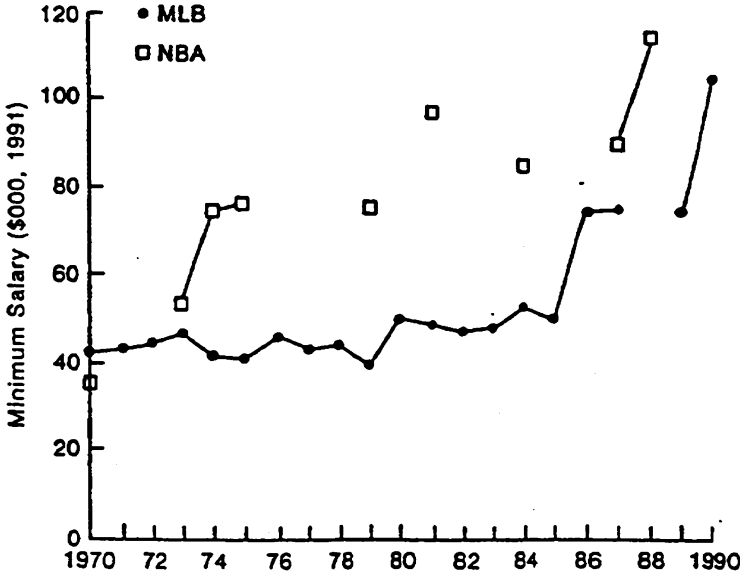

Figure 6.2 Minimum Salaries in Pro Sports, 1970–1990

player compensation in all sports, free agency is not the only candidate. Other factors must be at work as well, including the impressive increase in demand for pro team sports tickets, and the striking increase in value of pro sports television rights for all pro team sports, as noted in Chapter 1.

But the common perception of fans is that pro athletes are wildly overpaid, and that free agency is the culprit. Every red-blooded American boy wants to grow up to be a major leaguer in some sport, and most red-blooded American adult males would toss their careers in a minute if they thought they had a chance to make it in the pros. One example of this sports idolatry can be found in the vastly overinflated assessments that high school athletes make about their chances of turning pro, and, in turn, the similar mistaken perceptions that possess college athletes. Given that many fans would pay for the privilege of playing in the majors (and some actually do pay for the major league experience at adult major league baseball fantasy camps), fans find it a little difficult to accept the fact that pro athletes demand and get salaries in the six- or seven-figure range.

One way to add some perspective to the rise in real salaries for pro athletes is to look at the compensation paid to other entertainers. Perhaps Norby Walters put it best during his 1988 trial for signing college athletes to pro contracts prior to expiration of their college eligibility: "No difference. A sports star is a rock star. They're all the same" (quoted in Telander 1989, 41). Walters' insight is right on the mark—star pro athletes are entertainment stars every bit as much as movie and rock stars. The same factors are at work determining the sizes of the big incomes in sports as in other areas of entertainment. These factors are demand by the public for tickets to see stars, the rarity of skilled and/or charismatic individuals with star qualities (in the economist's jargon, an inelastic supply of talent), and the bargaining power of stars relative to that of the promoters who hire them (team owners in the case of pro sports). In explaining the rise in salaries for sports stars, both increases in the demand for their output and changes in their bargaining power (for example, free agency's replacing a reserve system) are relevant.

By way of comparison, Table 6.2 lists reported compensation for some prominent movie stars, from press reports in 1990 and 1991. Movie star's salaries compare more than favorably with those earned by pro sports stars. In another entertainment area, Janet Jackson reportedly received $15 million to sign with Virgin Records in 1991. The first album with her new label will earn her $5 million, while albums two and three will up the ante to $6 million and $7 million, respectively. In the same way that incentive clauses boost the pay of pro athletes, performance

Table 6.2
Movie Star Compensation, 1990–1991 (dollars)

Name	*Film*	*Compensation*
Sylvester Stallone	*Rocky V*	20 million
Jack Nicholson	*Batman*	11 million
Arnold Schwarzenegger	*Total Recall*	10 million
Tom Cruise	*Days of Thunder*	8 million
Bruce Willis	*Die Hard II*	7 million
Meryl Streep	Per picture	5 million
Cher	"	3–5 million
Sally Field	"	3–5 million
Jane Fonda	"	3–5 million
Michelle Pfeiffer	"	3–5 million
Sigourney Weaver	"	3–5 million

Source: New York Times, various issues, 1990, 1991.

clauses in her contract will make it possible for Janet Jackson to earn in the neighborhood of $10 million for each of the first three records she produces.

In an interesting analogy to the elimination of the reserve clause in baseball, movie entertainers' earnings skyrocketed with the breakdown of the "contract player" mode of operation in place in the motion picture industry until the 1950s. Studio owners of that era, much as sports team owners today, argued vigorously that the runaway growth in star salaries spelled disaster for their industry. True to predictions, the earnings of movie stars did go up dramatically, but the U.S. motion picture industry remains quite healthy even up to the present time, and is one of the few American industries that has retained its competitive edge in an international setting.

It is interesting that the public perception of the importance of rising salaries for entertainers is so different between movie stars and pro athletes. That star salaries in pop music or the movies cause little public concern is borne out by where news on salaries can be found. For example, the news of Janet Jackson's contract was found *inside* the entertainment section of the newspaper. If the level of discussion about salaries in movies and in popular music is a murmur, then it is a high-pitched scream in pro sports. Roger Clemens clearly is not in the same salary league with fellow entertainment stars Sylvester Stallone, Jack Nicholson, or Janet Jackson, but the behavior of baseball salaries generates statements like the ones of Commissioner Vincent and Mr. Dombrowski that opened this chapter, and opinions like those of Deputy (Base-

ball) Commissioner Steve Greenberg: "The current system is a prescription for disaster. But whether the disaster is just around the corner or will take place ten years from now, I don't know" (*Sporting News*, December 31, 1990).

To fans, the answer to why pro sports are different from other entertainment endeavors is obvious. Other mass entertainment media do not bring philosophers to their defense, lead presidents of the United States to throw out first pitches, or give poets pause to reflect. Whatever the reason, pro team sports are viewed differently from the other mass entertainment industries by almost everyone—fans, sportswriters, players, and owners. But there are some fundamental economic facts of life that apply across the board to all labor markets, including the market for rock stars and pro sports players.

The Workings of the Player Market

The market for any labor service, such as the market for the services of pro athletes, follows the good old law of supply and demand and operates on the basis of bids and offers by teams and players. Looking at things from the point of view of any team, we can calculate the *most* that a profit-oriented team would offer a player; it is the amount that the player would add to the team's revenue if he were signed. In the jargon of economists, as noted earlier, this is the player's *marginal revenue product*, which we will refer to as his *MRP*. The player's MRP is the most a team would pay a player because paying a player more than this would decrease team profits; on the other hand, signing a player for anything less than his MRP means that adding the player increases profits for the team.

When George Steinbrenner was running the Yankees, he was asked once how he decided how much to pay a player. He said, "It depends on how many fannies he puts in the seats." That was George's way of saying it depends on the player's MRP. A recent example illustrates the point. In May of 1991, the California Angels signed pitcher Fernando Valenzuela (just released by the L.A. Dodgers) for a $300,000 base salary, plus incentives that could have added up to $1 million for his total 1991 compensation. Alas for Fernando, his 1991 season was short, but his debut appearance in Anaheim drew 49,977 fans. The Angels' front office estimated that 25,000 of those tickets were sold because Valenzuela, rather than some other Angel pitcher, was on the mound. Even if all of these fans purchased $3 general admission tickets, $75,000 is a hefty offset (25 percent) of his base salary for just one appearance!

From the player's point of view, the least he would be willing to ac-

cept as a salary offer to sign with a team is what he could earn in his next-best employment opportunity (taking into account locational and other non-monetary considerations). We hesitate to push our luck, but economists refer to this next-highest employment value as the player's *reservation wage*. If a team offers a player less than his reservation wage, the player would simply reject the offer and remain employed in his next-best opportunity.

The player's MRP and reservation wage give the maximum and minimum limits on the salary that a player can be expected to earn. Just where the player's salary will end up within these limits depends on a number of considerations. Union activities have an impact, especially on players whose reservation wage would have been below the league-wide minimum salary resulting from collective bargaining. The most important consideration is the bargaining power of the player relative to that of the owner. Generally, the more close substitutes there are (that is, the easier he is to replace), the more bargaining power the team has, and the salary will be closer to the player's reservation wage than to his MRP. The more unique are the skills and drawing power of the player (that is, the tougher he is to replace), the more bargaining power the player has, and the closer the salary will be to the player's MRP.

Just how far apart the reservation wage and MRP limits on a player's salary will be depends critically on the negotiating rights for players and owners, built into the player market by the rules of the sport. At one extreme is complete free agency, where the ability of players and owners to negotiate with whomever they choose is unrestricted. At the other extreme is the reserve clause system that operated in baseball until 1976. Under the reserve clause, as we have seen in the previous chapter, a player can negotiate only with the team owning his contract. Generally speaking, the more freedom there is for players and owners to negotiate, the closer the minimum (reservation wage) and maximum (MRP) limits on a player's salary will be. However, there can be substantial remaining bargaining room even under unrestricted free agency.

Suppose first that there is unrestricted free agency, with players and owners free to negotiate with whomever they choose. Under such circumstances, if we ignore locational and other non-monetary considerations, each player will end up signing with the team to which he is most valuable (the team for which the player has the highest MRP). He will be paid a salary that lies between his MRP with that team, and his MRP with the team to which he is second most valuable (the team to which he has the second-highest MRP). The reason for this is that the team to which the player is most valuable can outbid any other team for the player's services, and still increase its profits by hiring him. But the team can sign the player only if it offers him at least as much as

the player can earn elsewhere (the player's reservation wage), and the most the player can earn elsewhere is clearly his MRP with the team to which he is second most valuable. In a market with completely unrestricted free agency, if we ignore non-monetary considerations, the grand conclusion is that the highest salary offered to the player will capture at least his *second*-highest value in the league, and can be up to (but not exceeding) his *highest* value in the league.

Under a reserve clause system, the team owning a player's contract has exclusive negotiating rights to the player. Similarly, the college draft gives the team holding a player's draft rights exclusive rights to negotiate with him (in baseball, for up to six years, and longer in football and hockey). Instead of a competitive market for the player's services, under a reserve clause system, there is only one bidder for the player's services. The highest salary the team holding the player's contract would be willing to pay the player still is the MRP of the player for that team; but under the reserve clause, there is no competitive pressure on the owner of the contract. As a result, the player's reservation wage is not bid up to his second-highest MRP in the league. Instead, the player's reservation wage under a reserve clause system is what the player can earn *outside* of the league, or the league minimum salary, whichever is higher.

Needless to say, for most athletes, the reservation wage calculated in this way lies far below the player's value to *any* team in the league. Under the reserve clause system, a player's wage will end up some place between his reservation wage and his MRP with the team owning his contract. The reserve clause system lowers the value of the player's reservation wage by eliminating competing offers by other teams, and, unless the player happens to be under contract with the team in the league to which he is most valuable, the upper bargaining limit has been reduced as well. Predictably, the overall effect of a reserve clause system is to lower player salaries relative to what they would earn under free agency.

Put another way, a reserve clause system acts to direct more of the revenue that a player produces to the team owner than to the player. The effect of unrestricted free agency on a league that previously was under a reserve clause system, as in the case of baseball since 1976, would be a bidding up of player salaries to the point where most of the revenue that is linked to the performance of the team ends up in player salaries. Under a reserve clause system, the team can capture a significant fraction of the revenue linked to a team's performance, as well as revenue that is not so linked.

For both players and owners, the issue of free agency is critical to their economic well-being. While claims that free agency will destroy

pro sports thus far are clearly exaggerated, the division of the monopoly rents created by pro sports certainly is at stake. It should come as no surprise, then, that free agency is the central issue in pro team sports collective bargaining. A secondary collective bargaining concern is the league minimum salary, which under a reserve clause system becomes the reservation wage for most players. Under free agency, the league minimum salary is no longer relevant to regulars, but it remains an important bargaining element for other players not yet eligible for free agency.

The point of all this is that the sports labor market has the same fundamental driving forces as any other labor market, that is, the value produced by an employee and his or her bargaining power, with the wage rate ending up somewhere between the reservation wage and the player's MRP, and with the player's MRP depending upon the demand by the public for the sport. Interestingly, what goes on in the player market is often portrayed in the press in exactly the opposite fashion, as though it were changes in player salaries that controlled ticket prices and TV revenues.

Ticket Price and Player Salaries

Owners of sports teams understandably are concerned about escalating salaries for players. After all, they have to pay the bills. But when owners and league commissioners express their opinions about the level of player salaries in public, they like to come on in their self-appointed role of protectors of the fans. Owners are fond of pointing out that if player salaries increase, they (the owners) will be forced to raise ticket prices, or turn to pay-per-view alternatives, in order to obtain the revenues to pay those salaries. The owners' line would have it that putting a brake on salary increases really is in the interest of fans, who prefer low ticket prices to high ones. This argument seems to be very effective, because fans typically side with the owners in salary disputes with players and in labor negotiations with player unions. The general sentiment was summed up by Carl Barger, president of the Pittsburgh Pirates, commenting on Cy Young Award winner Doug Drabeck's $3.5 million arbitration award: "Wouldn't it be tragic if it reached the point where you couldn't afford to win?" (*Sporting News*, March 4, 1991).

While the owners get effective mileage from this line, it makes very little economic sense. With some rare classic exceptions, such as Phil Wrigley and Tom Yawkey, owners of sports teams are in the business to make money, or at least not lose money. Nobody has to force an owner to raise ticket prices if he or she is fielding a successful team

with lots of popular support and a sold-out stadium. Put another way, even if player costs did not rise, one would expect that ticket prices and TV contract values would rise in the face of increasing fan demand. On the other hand, if the team already is having trouble selling tickets, only sheer folly would dictate raising ticket prices.

Given a team's roster of players, the simple economic fact of life is that the ticket pricing decision by a profit-oriented owner is completely independent of the salaries paid to those players. Profit-oriented ticket-pricing decisions depend solely on the demand by fans for tickets to the team's games. The demand for the inputs used to produce the games, including players, is derived from this profit-oriented decision, not the other way around. Ticket prices rise when fan demand rises, which in turn increases player MRPs, which spills over into higher salaries for players.

Nowhere is this logic more clearly evident than in the case of baseball in the period just after the beginning of free agency. Free agency acted immediately to raise player salaries, as indicated earlier in Figure 6.1. But fans would not pay more to watch the same players just because they started earning more. The initial effect of free agency was to lower team profits with little impact on ticket prices. Table 6.3 gives ticket prices (in 1991 dollars) around the relevant years, 1971–1990. With few exceptions, ticket prices *fell* in real terms during the very first years of free agency! Indeed, only the Boston Red Sox and New York Yankees had ticket prices in excess of their 1971 levels as late as 1980, four years after free agency. Thus, salaries rose, but ticket prices did not. Ticket prices prior to free agency were already set by owners at levels representing their best guesses as to what would maximize revenue for their teams. Free agency shifted the bargaining power in the direction of players, and player salaries went up. But changes in player salaries per se had no effect on the demand for tickets and no effect on ticket prices.

Tables 6.4 and 6.5 show baseball ticket prices and player salaries by team during the free agency era of the 1980s. This has been a period of rising demand by the public for the major pro team sports. Rising demand led to increases in both ticket prices and TV contract revenues. In turn, the increased demand for pro sports tickets and TV coverage acted to increase the value of skilled players to teams, that is, their MRPs rose. Then, the bargaining process translated the increased value of player skills into higher player salaries. Salaries continued to grow through the 1980s for all pro sports, spurred on by the growth in team revenues. Under free agency, as in baseball and basketball, more of the increased revenue goes to players than under a reserve clause system, such as that in football and hockey. But salaries go up in either case

Table 6.3
Baseball Ticket Prices before and after Free Agency, Various Years, 1971–1980 (1991 dollars)

Team	*1971*	*1975*	*1976*	*1977*	*1978*	*1979*	*1980*
NATIONAL LEAGUE							
Atlanta	9.06	9.66	9.14	8.58	7.97	7.16	6.31
Chicago	9.60	7.20	7.81	8.33	8.47	7.94	7.99
Cincinnati	11.10	9.76	9.23	8.67	9.10	8.17	7.90
Houston	11.37	9.99	9.45	9.12	8.68	8.26	8.05
Los Angeles	—	7.55	9.07	8.51	8.22	7.39	6.51
Montreal	10.16	8.51	8.04	7.55	9.20	8.26	9.50
New York	10.53	8.10	7.66	8.18	7.60	6.92	7.44
Philadelphia	11.13	8.58	8.83	8.29	7.70	6.92	7.44
Pittsburgh	10.16	8.71	8.23	8.18	9.22	8.28	7.64
St. Louis	10.00	8.46	8.45	9.23	8.97	8.06	8.04
San Diego	8.73	5.76	6.07	6.23	5.79	6.23	5.49
San Francisco	13.37	9.04	8.54	8.87	8.24	7.40	7.87
AMERICAN LEAGUE							
Baltimore	9.36	6.52	6.16	5.97	6.67	6.99	6.54
Boston	7.76	8.96	8.95	9.52	9.28	8.34	8.04
California	11.70	7.90	7.47	7.95	7.10	6.77	5.96
Chicago	8.66	7.07	6.66	6.70	6.94	7.16	7.10
Cleveland	11.00	8.18	7.73	7.91	9.20	8.37	7.39
Detroit	9.19	7.70	7.28	7.51	9.12	8.19	7.81
Kansas City	9.56	10.49	9.92	9.32	9.45	8.49	7.46
Milwaukee	10.83	8.05	7.61	7.64	8.47	7.61	8.07
Minnesota	9.66	7.88	7.45	8.62	7.64	8.47	7.61
New York	9.39	8.98	10.64	11.17	11.32	10.82	10.12
Oakland	9.49	8.68	8.88	8.33	7.75	6.96	6.13
Seattle	—	—	—	8.45	7.85	7.42	6.61
Texas	—	8.20	7.76	8.33	8.16	7.33	7.90
Toronto	—	—	—	8.94	8.31	7.91	6.97

Source: Data provided by Roger Noll, Stanford University.
Note: Values are averages of ticket prices for types of seats, weighted by the proportion of each type of seat.

when demand for the sport increases, and, contrary to the argument of owners, they are the effect and not the cause of higher ticket prices.

It might be that the mistaken perception about the link between player salaries and ticket prices comes from a confusion of two different sources of salary escalation. If a team's salary bill rises because the team has acquired more expensive talent, then the owner can and undoubtedly will raise ticket prices, not because he or she is

Table 6.4
Baseball Ticket Prices in the Free Agency Era, 1981–1988 (1991 dollars)

Team	*1981*	*1982*	*1983*	*1984*	*1985*	*1986*	*1987*	*1988*
NATIONAL LEAGUE								
Atlanta	7.43	6.37	7.16	7.28	7.03	6.91	6.66	6.40
Chicago	7.24	6.82	7.35	7.39	8.58	8.43	8.13	7.81
Cincinnati	7.81	7.35	8.01	7.68	7.79	7.65	7.38	7.08
Houston	6.85	7.45	7.19	6.89	7.92	7.77	7.50	7.20
Los Angeles	7.08	7.60	6.91	6.62	6.39	6.28	6.05	5.81
Montreal	8.61	9.20	9.45	9.06	8.56	8.40	8.10	7.78
New York	6.61	6.23	7.79	7.47	8.47	8.31	8.02	7.70
Philadelphia	7.19	6.78	7.60	7.28	7.49	7.35	7.09	6.81
Pittsburgh	7.39	6.96	6.62	7.71	7.45	7.31	7.06	6.78
St. Louis	8.03	7.77	8.17	7.83	8.25	8.10	7.82	7.51
San Diego	6.57	6.19	6.81	7.19	7.22	7.09	6.84	6.57
San Francisco	7.13	6.72	7.97	7.64	7.37	7.24	6.98	6.71
AMERICAN LEAGUE								
Baltimore	7.48	7.98	7.74	7.42	7.16	7.03	6.78	6.51
Boston	8.03	7.56	7.33	8.97	8.91	8.75	8.44	8.10
California	6.26	6.38	7.06	6.76	6.53	6.41	6.19	5.94
Chicago	7.30	6.13	7.41	7.52	7.26	7.13	6.88	6.60
Cleveland	7.12	6.71	7.56	7.25	6.95	6.82	6.58	6.32
Detroit	8.45	8.53	9.11	8.73	8.43	8.28	7.99	7.67
Kansas City	7.13	6.72	7.95	7.62	7.36	7.23	6.97	6.70
Milwaukee	8.03	7.56	8.63	8.28	7.99	7.84	7.57	7.27
Minnesota	7.97	10.17	9.57	7.82	7.55	7.41	7.15	6.87
New York	9.18	9.84	10.51	10.07	10.58	10.39	10.02	9.63
Oakland	7.05	6.72	6.51	7.18	7.97	7.82	7.54	7.24
Seattle	6.76	7.02	6.89	7.25	7.49	7.35	7.09	6.81
Texas	7.45	7.02	8.14	7.43	7.68	7.54	7.27	6.98
Toronto	7.05	6.64	6.80	7.65	8.81	8.65	8.34	8.01

Source: As in table 6.3.

paying more in salaries, but because he or she is fielding a more attractive team. That was certainly the case with the Yankees in the early days of free agency, as shown in Table 6.3. But looking at the league as a whole, the same group of players was around right after free agency as before, so for an average team, the quality of players didn't change. Consequently, there was no way that the average owner could pass on to fans the increase in salaries that came with free agency; the salary cost increase came directly out of profits, instead.

Table 6.5
Average Salaries by Team, Baseball, 1983–1991 (thousands of 1991 dollars)

Team	*1983*	*1984*	*1985*	*1986*	*1987*	*1988*	*1989*	*1990*	*1991*
NATIONAL LEAGUE									
Atlanta	473	525	681	812	576	440	367	455	701
Chicago	366	550	521	373	595	540	460	523	1,073
Cincinnati	325	351	424	493	413	349	429	571	928
Houston	496	499	461	536	532	624	613	746	465
Los Angeles	392	412	534	614	482	656	750	672	1,041
Montreal	480	480	397	387	364	393	600	568	697
New York	416	369	490	590	660	693	938	768	1,253
Philadelphia	601	523	503	454	542	575	326	402	717
Pittsburgh	428	431	494	370	192	351	437	590	923
St. Louis	353	379	486	428	481	598	608	635	794
San Diego	356	406	504	591	439	469	565	688	779
San Francisco	337	368	403	352	467	462	612	616	1,142
AMERICAN LEAGUE									
Baltimore	415	469	551	555	584	486	355	301	542
Boston	360	388	486	730	604	698	729	744	1,260
California	530	562	546	650	531	478	637	682	1,096
Chicago	396	583	439	401	411	259	332	414	573
Cleveland	329	208	277	333	338	350	372	520	695
Detroit	359	484	512	577	638	701	544	730	1,106
Kansas City	421	379	464	596	662	598	630	750	1,172
Milwaukee	479	502	542	439	377	441	389	633	904
Minnesota	133	224	325	451	593	511	561	541	930
New York	630	598	688	763	646	823	614	761	1,062
Oakland	363	500	443	415	495	486	777	670	1,397
Seattle	162	220	214	232	261	278	320	353	576
Texas	246	322	324	300	280	276	409	539	738
Toronto	290	385	486	524	593	554	649	762	888

Sources: Data for 1983–1987 are from Paul Staudohar, *The Sports Industry and Collective Bargaining* (Ithaca, N.Y.: ILR Press, 1989), 32. The remaining data are from *Sporting News*, various issues.

The Winner's Curse

Things are not quite as simple as we have been making them, of course—general managers and scouts really do earn the money they are paid. It is no easy task to predict how a player will perform next season, what his contribution to the team will be, and the size of the crowds the team will draw. Correctly evaluating the MRP of a player is a skill

that earns successful general managers like Andy McPhail of the Twins salaries in the high six-figure range.

We do not pretend to any such skills. Instead, we assume that the market for players "works" in the sense that, on average, bids by skilled general managers and offers by skilled player agents lead to a situation in which players get paid pretty much according to what we have outlined, that is, what they would be worth in their second-best employment in the league.

Well, actually, they may get a little more than that, and maybe even more than their MRPs to the teams that sign them. There is a well-known phenomenon in bidding theory known as "the winner's curse," which might be operative in the player markets of the free agency period. It is a little easier to explain this in the context of a sealed-bid auction, so let's start with that.

In a sealed-bid auction, say, for league TV rights, the prospective bidders (the networks and cable systems) each evaluate the revenue potential of the TV rights and then, at a specified time, each in effect submits a dollar bid in a sealed envelope. The "lucky" winner is the individual submitting the highest bid. "Lucky" is in quotes, because, by definition, the winning bidder ends up paying more for the right to televise games, and occasionally much more, than any other bidder was willing to offer. Given that all bidders had access to pretty much the same information about the potential market for TV, this suggests that the winner might well have made a mistake in overvaluing the revenue potential of the contract. This is "the winner's curse"—winning in a sealed-bid auction means the winner might very well have bid too much, and maybe far too much, for the property. In particular, a measure of how much the winner has overbid is the difference between the winner's bid and the second-highest bid. In the jargon of the field, this difference is what is "left on the table."

The recent experience of CBS in connection with its baseball TV contract is convincing evidence of existence of the "winner's curse." It now is pretty much generally accepted that CBS dramatically overbid for the television contract it received from major league baseball.

The free agent market in baseball is not as formal as a sealed-bid auction, but there are problems for a general manager in determining how much a player will be worth to his team and in guessing how much other teams will be willing to offer the player. Ideally, a general manager would like to pay any player just $1 more than the player's best offer anywhere else, but this option is only available in cases where the team has "right of first refusal," that is, the right to match any outside offer.

With lots of teams out there operating in the free agent market (and assuming no collusion), there will be vigorous competitive bidding for

players. Clearly, teams underestimating the MRPs of free agents will typically not be the teams signing them; instead, there is better chance that the "winners" in the free agent market will be teams overestimating player MRPs, and these are the teams stuck with the "winner's curse." And, in turn, the presence of the winner's curse means that players get paid on average even more than their value in their second-best employment opportunities in the league. This cannot be too surprising. Sportswriters, each year, are fond of rubbing owners' noses in the winner's curse by pointing out how overpaid many (some would say most) free agents are, relative to their subsequent performance.

Salary Determination in Baseball

Assuming that the baseball player market operates to generate salary offers that correlate roughly with player MRPs, we can identify factors that can be said to "determine" baseball player salaries in the sense that these factors are highly correlated with market-determined salary levels, and thus do a good job of predicting the level of baseball player salaries. For each of several time periods, a simple equation is used to estimate the salary of any player based on his playing time, on-field performance, age-experience relationship, and player category (for example, rookie, hopeful, veteran). The equation can be thought of as estimating the player's MRP in that time period. The equation is a "best fit" model of salary determination in the sense that (1) it explains a large portion of the total variation in player salaries, and (2) adding other factors to the equation would not significantly improve its predictive power. Models such as those specified below are used both by players and by owners in justifying their positions on salary demands in the baseball salary arbitration process.

Our player salary model is based on an extensive data set, covering salaries in 1965–1974, 1976–1977, and 1986–1990. For the reserve clause period (1965–1974), salaries are from a player sample that is dramatically different from those used in past studies. The data were collected by agents of the Internal Revenue Service and employees of the American League office, as evidence in a tax case involving the Milwaukee Brewers (*Allan Selig v. United States*, 565 F. Supp 524 (1983), 740 F.2d 572 (1984); see Chapter 3 for details). The data cover the salaries of all major league players who were traded or sold in baseball between 1965 and 1974 in transactions that involved American League players. Rich Hill at Central Michigan University provided the immediate free agency period data (1976–1977), and Phil Porter at the University of South Florida shared his 1986 data set. The remainder of the salary data

came from published reports in the *New York Times*, the *Sporting News*, and the *San Francisco Chronicle*.

Table 6.6 lists the players with the top 26 salaries in the 1991 season, and traces their earnings (in 1991 dollars) back to 1986. All players listed in the table earned $3.2 million or more in 1991; free agent eligibility is indicated by an asterisk. Even in real terms, all but three of these mega-stars more than doubled their salaries between 1986 and

Table 6.6
Salary Histories for Top 1991 Earners, Baseball, 1986–1991
(thousands of 1991 dollars)

Player	*1991*	*1990*	*1989*	*1988*	*1987*	*1986*
Boddicker, Mike	3,167	705	1,501	973[a]	954	1,035
Canseco, Jose	3,500	2,098[a]	1,747	372	197	86
Clark, Will	3,750[a]	2,375	1,228	366	143	74
Darwin, Danny	3,250	1,383	890	870	852	754
Davis, Eric	3,600	2,192	1,698[a]	1,029	358	111
Davis, Glenn	3,275	2,072	1,185[a]	389	256	148
Davis, Mark	3,625	2,218	655	595	495[a]	432
Dawson, Andre	3,300	2,192	2,293	2,117	596	1,293
Drabek, Doug	3,350[a]	1,148	355	183	101	74
Henderson, Rickey	3,250	2,349	2,315	2,026	1,990	1,940
Hershiser, Orel	3,167	2,053	3,021[a]	1,259	954	1,235
Langston, Mark	3,550	1,879	1,529[a]	939	441	299
Martinez, Dennis	3,333	1,537	803	841	992	692
Mattingly, Don	3,420	2,610	2,402	2,289[a]	2,354	1,699
McGee, Willie	3,562	1,566	1,529	1,373	834	618
Mitchell, Kevin	3,750[a]	2,201	611	272	149	74
Molitor, Paul	3,233	2,540	1,911	1,602	1,502	1,433
Puckett, Kirby	3,167	2,819	2,238[a]	1,248	435	315
Raines, Tim	3,500	2,275	2,299	1,907	—	1,872[a]
Ryan, Nolan	3,300	1,462	2,020	1,145	1,192	1,390
Stewart, Dave	3,500	1,148	1,174	687	596	494
Strawberry, Darryl	3,800	1,931	1,578	1,511[a]	1,454	1,167
Viola, Frank	3,167	2,053	3,021	1,545	989[a]	833
Welch, Bob	3,450	1,392	1,237	1,074	999	919
Winfield, Dave	3,300	2,242	2,139	2,242	2,218	2,306
Yount, Robin	3,200	3,341	1,256	1,316	1,192	1,174

Sources: Data for 1986 were provided by Phil Porter. Later data are from the *New York Times*, *Sporting News*, and the *San Francisco Chronicle*, various issues.

[a]The player's sixth full major league year (40 at-bats or 30 innings pitched). For older players, free agency occurred as follows: Darwin, 1984; Dawson, 1981; Henderson, 1984; Martinez, 1982; Molitor, 1983; Ryan, 1976; Welch, 1983; Winfield, 1978; Yount, 1979.

1991. Indeed, for the younger players, the increases, even in real terms, are staggering. For example, Will Clark and Kevin Mitchell of the San Francisco Giants earned six-year increases in the 5,000 percent (50 times!) range, while Jose Canseco of the Oakland A's and Doug Drabek of the Pittsburgh Pirates had to settle for increases in the 4,000 percent range. In addition, and in keeping with our earlier discussion of the impact of free agency, dramatic increases typically occur on or near the year of eligibility for free agency.

In explaining salary histories such as those in Table 6.6, the estimating model we use is built upon the pioneering work in the area by Scully (1974b), although some of the variables Scully used have since been found to carry little weight, and the final model used here represents an improvement over his original attempts. The variables used to explain salaries are of four basic types: playing time, on-field performance, age and experience, and a few used to distinguish types of players (pitchers and hitters, rookies and regulars, and major league hopefuls).

Playing time for hitters is measured by the player's lifetime share of total team at-bats, while the variable that captures the playing time of pitchers is their lifetime share of total team innings pitched. The idea behind these playing time variables is that the best judge of the quality of a player is the manager of the player's team. Managers try to get as much use out of the best players as possible. This argues that playing time is a good measure to use as a proxy for the contribution a player makes to the success of a team. It gives explicit recognition to the manager's decision as to who will play for the team on a day-to-day basis.

Left as it is, the playing time variable for pitchers overstates the value of starters relative to relievers. To capture this difference, a pitcher's proportion of games started out of all appearances is used. Further, for all players, recent playing time (departure from lifetime average) may be used as an adjustment in the salary determination process. For variables that measure playing time, a substantial change from career averages can occur because of injuries that may have a bearing on a player's long-run abilities. Poor players may get more playing time in a given season because of an injury to a regular in the starting lineup, or a starting regular may be out of the lineup temporarily because of an injury that is not permanently disabling.

On-field performance is captured by power indexes. For hitters, slugging average (total bases from base hits, divided by number of at-bats) provides the index, while power pitching (strikeout to walk ratio) works best for pitchers. It might be thought that other on-field performance variables should be included, as well as assessments made after a player's on-field performance has occurred (for example, Cy Young, Fireman of the Year, MVP, and batting title awards). But it turns out that once

playing time and the power index are in the equation, any other measures of on-field performance are so highly correlated with them that they provide no significant increases in the predictive power of the equation.

The estimating equation also makes allowance for the age and experience of players, for rookies, "star quality" players, and "hopefuls" (players with less than five years on a major league roster and less than 40 at-bats in any season, or less than 30 innings pitched in any season for pitchers).

Finally, in estimating salaries, the introduction of free agency represents the major change in the entire salary process. This dramatic structural change suggests that the salary process during the reserve clause period (1965–1974 in our data set), the transition period (1976–1977), and the free agency period (1986–1990 in our data set) are quite different. Thus in each period, we would expect to find different estimating equations relating performance and other variables to salaries. The approach adopted here to test this hypothesis involves estimating the salaries of free agents separately from those of other players, and then using a simple, widely accepted statistical test to decide whether or not the salary equation generates different results for free agents than for other players.

Taking this approach, it can be concluded that the salary process during the reserve clause period differs significantly from the process operating during the transition period and the free agency period. Within the transition period (1976–1977), the data reveal that the salary process for free agents was different from that for other players in 1976, but not in 1977. In the 1986–1990 period of free agency, the salary determination process is different for free agents than for other players in all years from 1987 through 1990, but not for 1986, a year in which collusion by owners occurred. Finally, the salary process differs from year to year during the 1986–1990 period, except for non-free agents in 1987 and 1988. It is unclear whether this volatility is due to collective bargaining gains by free agents or the shifting nature of the demand for baseball, or both.

Salary Estimation Equations

The salary estimation equations appear in the appendix to this chapter (p. 369). The estimation equations are log linear in form (alternatively, salary is taken to be a product of factors, each raised to a power estimated from the data set), but the specifics are of less importance than the general features of the approach.

In the estimating equations, playing time and performance (power index) variables perform as expected (more playing time or higher performance leads to a higher salary). Young players get paid less simply because they are young, but the impact was much stronger in the reserve clause period than afterward. On the other hand, rookies and hopefuls typically received a salary increment relative to other players with the same performance and playing time stats. Most important, the clearest result from the equations is that the impact of playing time and performance (and the other determinants of salary) has been rising over time, reflecting the rising average level of salaries (in 1991 dollars) from the reserve clause period to the present. For non-free agents in the 1986–1990 period, playing time elasticities (percent change in salary per 1 percent change in playing time) are up nearly 100 percent for hitters and 50 percent for pitchers, relative to the reserve clause period. Performance elasticities are up only slightly for non-free agent hitters, but up 100 percent for non-free agent pitchers.

For free agents, playing time elasticities haven't changed much for hitters as between the reserve clause era and recent years, but they are up 100 percent for pitchers. Performance elasticities for free agents have simply exploded, rising by 300 to 400 percent for hitters and 200 to 300 percent for pitchers. What this means is that for free agents, a 1 percent increase in the slugging average for a hitter produces a three to four times higher percentage increase in salary in 1990 as it did, say, in 1975. Again, this raises the question of whether this general growth in the overall levels of salary determinants is due to free agency, or due to the rise in demand for baseball.

A natural question to raise is how well the salary estimation model performs as a predictor of player salaries. Table 6.7 lists the salaries for a sample of players in each of three time periods (reserve clause, transition, free agency), converts these to 1991 dollars, and then compares these salaries to the salaries predicted by the salary estimation equations. The total variation in salaries that is explained by the estimation equation for the relevant years is given (81 percent for 1969, 80 percent for 1976, and 53 percent for 1990). This "goodness of fit" statistic is an important indicator of the believability of the estimates.

Turning to the difference between actual and estimated salaries, the differences are all positive, suggesting that these highly paid players were all overpaid in each year, whether during a reserve clause or free agency period. But the salary model we are using estimates a player's MRP solely on the basis of his contribution to a team's success on the field. The other important element of a player's MRP, his fan attraction, is difficult to incorporate into salary estimation equations. Star or superstar players attract fans to games not only on the basis of how

Table 6.7
Predicted and Actual Salaries, Selected Players, Reserve Clause, Transition, and Free Agency Periods

Player	*Actual Salary (dollars)*	*Salary (1991 dollars)*	*Predicted Salary (1991 dollars)*	*% Difference*
RESERVE CLAUSE PERIOD[a]				
Adair, Ken	44,000	164,560	95,439	72
Alou, Felipe	60,000	224,400	173,899	29
Chance, Dean	55,000	205,700	197,395	4
Davis, Tommy	69,000	258,060	135,458	91
Dillman, Bill	50,000	187,000	30,853	506
Ellsworth, Dick	50,000	187,000	136,798	37
Flood, Curt	90,000	336,600	165,621	103
Harrelson, Ken	50,000	187,000	110,728	69
Pascual, Camillo	51,000	190,740	175,943	8
Pinson, Vada	60,500	226,270	186,871	21
TRANSITION PERIOD: 1976[b]				
Brock, Lou	185,000	445,850	282,255	58
Holtzman, Ken	165,000	397,650	329,035	21
Jackson, Reggie	185,000	445,850	283,569	57
Messersmith, Andy	200,000	482,000	346,877	39
Montanez, Willie	156,000	375,960	187,643	100
Morgan, Joe	200,000	482,000	238,011	103
Murcer, Bobby	160,000	385,600	233,678	65
Palmer, Jim	177,500	427,775	369,719	16
Ryan, Nolan	170,000	409,700	252,510	62
Tiant, Luis	160,000	385,600	242,855	59
FREE AGENCY PERIOD: 1990[c]				
Bell, George	2,035,000	2,136,750	1,724,622	24
Gooden, Dwight	1,916,667	2,012,500	1,183,565	70
Hayes, Von	2,000,000	2,100,000	1,181,912	78
Higuera, Ted	2,125,000	2,231,250	795,035	181
Parrish, Lance	1,991,667	2,091,250	1,117,814	87
Puckett, Kirby	2,700,000	2,835,000	1,946,532	46
Scott, Mike	2,187,500	2,296,875	939,221	145
Sutcliffe, Rick	1,925,000	2,021,250	1,290,305	57
Valenzuela, Fernando	2,200,000	2,310,000	675,858	242
Yount, Robin	3,200,000	3,360,000	1,792,034	87

[a]Explained variation: 81%.
[b]Explained variation: 80%.
[c]Explained variation: 53%.

much they add to a team's won-lost record, but also because of their own distinctive appeal as charismatic individuals. Bill Veeck used to argue that baseball and the other sports are really selling "dreams," and not just pennant races. Owners and players alike are aware of this, so star drawing power is reflected in player salaries, as indicated by the data in Table 6.7.

Some of the other larger differences are explained by contract inflexibilities not captured by the equations. For example, Bill Dillman was a pitcher of great promise (Baltimore's sixth pick in the very first draft in 1965) signed to a multi-year contract, who managed to pitch in only 50 games in two disappointing major league years. As another example, in 1990, the impending end of Fernando Valenzuela's career was becoming apparent in his performance, but because of his multi-year contract, his salary remained well in excess of his revealed ability. Table 6.7 provides some evidence for the reliability of the salary estimation equations, and their limitations as well.

Table 6.8 illustrates the use of the salary estimation equations in a different way, by displaying the variation in predicted salaries over time. Fifteen players were chosen to represent a range of salaries in

Table 6.8
Predicted Salary Comparisons, Selected Players, 1990
(thousands of 1991 dollars)

Name	*Salary in 1990*	*Predicted Salary*			*% Change*	
		1969	*1976*	*1990*	*1969–1976*	*1976–1990*
Bell, George	2,124	147	272	1,697	84	524
Crim, Chuck	626	81	170	949	110	458
Dascenzo, Doug	117	33	40	166	21	313
Downs, Kelly	463	52	49	384	−6	686
Eckersley, Dennis	1,649	135	89	714	−35	705
Farr, Steve	809	66	76	511	14	576
Gedman, Rich	960	95	131	582	38	344
Hennerman, Mike	350	70	110	649	56	491
Lansford, Carney	1,383	168	263	1,295	57	392
Rohde, Dave	104	22	15	36	−33	142
Smith, Dwight (Cubs)	188	74	116	811	57	602
Stewart, Dave	1,148	122	215	1,648	75	666
Venable, Max	245	54	68	244	24	261
Vizquet, Omar	141	54	73	865	36	1,078
Whiten, Mark	104	19	14	56	−28	296

1990, and the estimating equations for 1969, 1976, and 1990 were used to predict their salaries in 1969, 1976, and 1990 on the basis of their performance in 1990. The results in Table 6.8 show how these players' salaries would have changed over time (with constant performance) as between the reserve clause, transition, and free agency periods. The unweighted average percentage increase in salary between 1969 and 1976 was 31 percent, and the unweighted average percent increase between 1976 and 1990 was 502 percent. For this group of 15 players, the average salaries (in 1991 dollars) predicted by the estimation equations are as follows: for 1969, $79,000; for 1976, $113,000; for 1990, $707,000. Thus, on average in this group, a player would have earned almost $600,000 more in 1990 than in 1976, given the same performance on the field, in dollars of constant purchasing power. Looking at how a given group of players would have been treated in the reserve clause, transition, and free agency periods serves to point out how free agency combined with a rising demand for baseball has impacted baseball salaries throughout the entire salary distribution.

The most interesting finding shown in Table 6.8 is how large the predicted increases in salary have been since the 1976–1977 transition period. Intuitively, it seems likely that the effects of free agency per se would be concentrated in the early years, following the changeover from the reserve clause, as owners and players learned how the new system works. Once free agency had been absorbed into the salary negotiation process, any further increases in salaries would have occurred only as player MRPs rose, say, in response to an increase in demand for baseball by fans. (An important qualification to this, of course, is the period of collusion by owners.) In any case, this strongly suggests that increases in salaries in recent years, 10 or more years after the introduction of free agency, reflect primarily the impact of increased demand for baseball rather than any lingering effects from the introduction of free agency. One way to test this is to look at changes over time in the value of free agency to players.

The Value of Free Agency to Players

The value of free agency to any player is the difference between what the player earns under free agency and what the player would have been paid as a non-free agent. We are interested in seeing how this has changed over time. The period chosen for calculating the value of free agency is the 1986–1990 free agent period. In order to make the comparison, players who were free agents during this period are also treated as if they never achieved free agency. The value of free agency for a player

is, then, the difference between a player's estimated value as a free agent, and his estimated value as a non-free agent.

For 1986, the salary estimation model for free agents could not be distinguished statistically from the model for non-free agents—that is, on average, given the same performance and playing time characteristics, the salary earned by a player was the same whether he was a free agent in 1986 or was a non-free agent. Thus, for 1986, on average, the value of free agency to players was zero. This simply corroborates all of the other evidence of collusion in the 1986 free agent market, for example, lack of salary offers by other teams for free agents of any given team, lack of movement of free agent players from team to team, and the flattening out of the rise in average salaries shown in Figure 6.1.

For 1987 through 1990, the value of free agency was calculated by taking a sample of players in each year. The players chosen for the sample were those that occupied the deciles (10 percent, 20 percent, ... 90 percent, 99 percent) of the salary distribution for each year. Even though the particular players occupying each decile might be different in each year, they represent 10 percent increments in the salary distribution for that year. Interestingly, with the exception of 2 of the 40 observations, all of the players had achieved free agent eligilibity (in their sixth major league season or more). Thus, while estimating free agent salaries would be required for non-free agents, for this sample we calculate the value of free agency as the difference between actual observed salary and estimated non-free agent salary.

Average values for free agency are reported here in two ways in order to portray how the value of free agency has changed over the sample period and how the value of free agency varies for deciles of the salary distribution. First, we turn to an analysis of how the value of free agency changed over time during 1986–1990. The value of free agency is calculated for each year, 1987 through 1990, as follows. For each year, we calculate the average difference between actual salary and estimated non-free agent salary, using an unweighted average of the 10 decile observations. This is an estimate of the value of free agency for each year. We then divide the estimated value of free agency for each year by the average actual salary for the year, again using an unweighted average of the 10 decile observations. The ratio tells us how much, percentage-wise, free agency added to average salaries for the year.

The results are as follows:

1986 Free agency added nothing to average salaries.
1987 Free agency added 28 percent to average salaries.
1988 Free agency added 59 percent to average salaries.
1989 Free agency added 22 percent to average salaries.

1990 Free agency added 23 percent to average salaries.

This pattern of the value of free agency yields two important conclusions. First, the approximate doubling of the value of free agency in 1988 shows that the salary determination process captured the discounted present value of the record-setting television contract set to begin in 1989. But, despite the large increases in average salaries that occurred in 1989 and 1990, free agency added no more percentagwise to average salaries in these years than it had in 1987. Instead, what was going on was that salaries of both free and non-free agents were increasing, more or less proportionately, as would be expected in as period of rising demand for baseball.

The fact that there was no differential percentage increase in free agent salaries relative to non-free agent salaries is evidence supporting the conclusion that what occurred in the late 1980s and early 1990s was a demand-driven escalation of player salaries, rather than an escalation arising from free agency per se. Since free agents and non-free agents are close substitutes for each other, absent other exogenous changes, salaries of the two types of players would be expected to move together, with free agent salaries incorporating a premium that reflects their superior bargaining power.

Next, we look at the value of free agency across deciles in the salary distribution. The data in Table 6.9 show that the value of free agency typically rises with player salaries. But the largest increases occur as players move from the 20th to the 30th and from the 80th to the 90th salary deciles. The move from the 20th to the 30th decile probably reflects the initial attainment of free agent eligibility (younger players reaching the six-year free agency threshold), while the move from the 80th to the 90th represents the leap in the value of free agency as a player joins the ranks of the true giants of the current game. While none of this should come as any surprise, it is important to note that while the large jumps at these two important points in the salary distribution are similar percentagewise, the value of free agency at the 90th decile is nearly 2.5 times the value of free agency at the 30th decile. As documented in the next section of this chapter, there is nothing at all equal about the distribution of salaries in professional baseball.

The upshot of all this is that, while baseball salaries have been rising, there is no indication that the value of free agency to players has been increasing, at least in the late 1980s and early 1990s. This means that there is no apparent independent effect of free agency present in the salary figures. Instead, the increase in baseball salaries following collusion in 1986 can be explained simply by the increase in gate receipts and television revenue that occurred over that period.

Table 6.9
The Estimated Value of Free Agency, 1987–1990
(thousands of 1991 dollars)

Decile	*Average Value*[a]	*Percent Change*[b]
99th	941,347	+14.3
90th	823,866	+66.8
80th	494,017	+ 6.0
70th	465,884	+18.2
60th	394,273	+17.3
50th	336,196	− 3.8
40th	349,641	+ 5.8
30th	330,413	+78.7
20th	184,922	− 3.5
10th	191,613	

[a]Calculated as the average of the estimated values of free agency for the players occupying the stated decile over the period 1987–1990. The estimated value of free agency is actual salary minus estimated non-free-agent salary.
[b]Percentage change from next lower decile.

The Salary Distribution in Sports

Finally, we want to look into the question of the degree of inequality in the salary distribution in sports, and how this has been affected by free agency. In particular, are superstars the most favored beneficiaries of free agency, so that the salary distribution becomes more unequal under free agency, or does free agency spread the benefits of competitive markets around more or less equally? Which sports leagues have the most equal salary distributions?

We begin by looking at baseball, the sport with a salary data set covering years in the reserve clause era, the transition period, and the free agency period. The tool we use to address the characteristics of the salary distribution is the Lorenz curve (see also the discussion of competitive balance and the Lorenz curve in Chapter 7). Figures 6.3 and 6.4 show the Lorenz curves in baseball for 1974 and 1990, respectively, as representative of the reserve clause and free agency periods. On the horizontal axis is the cumulative percentage of players (the cumulative distribution of salary earners arrayed from lowest to highest salary), and on the vertical axis is the cumulative percentage of salary income. We plot the Lorenz curve by associating with each cumulative percentage of players the cumulative percentage of total salary income for the

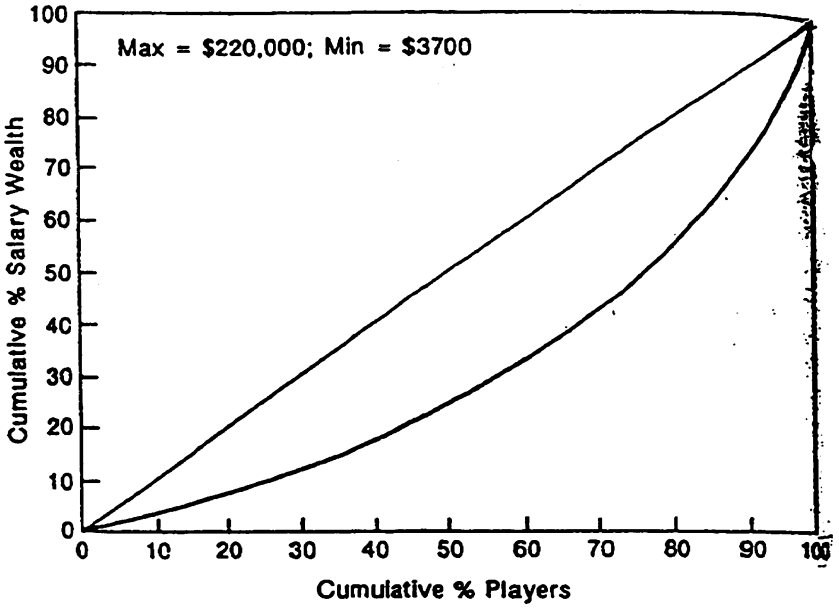

Figure 6.3 Baseball Salary Lorenz Curve, 1974

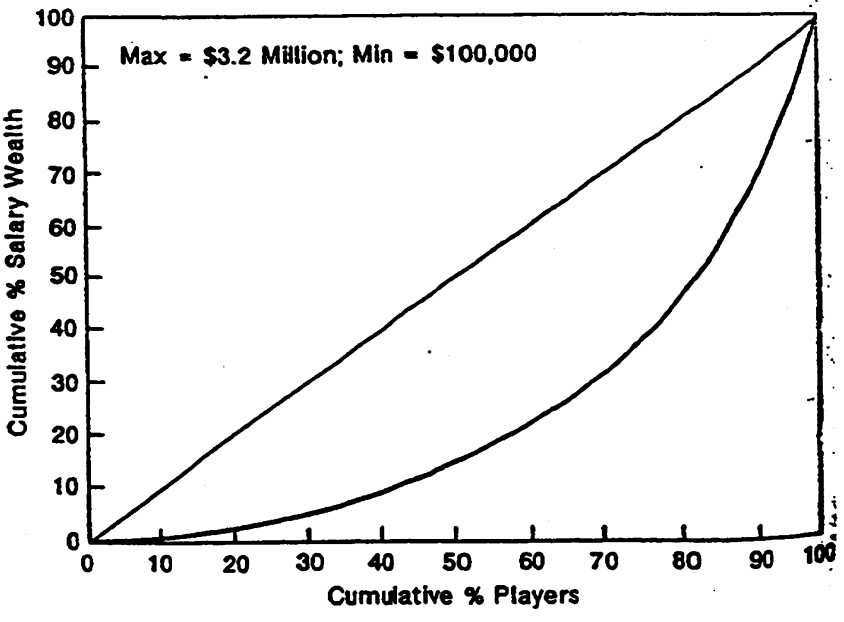

Figure 6.4 Baseball Salary Lorenz Curve, 1990

league that they earn. A Lorenz curve in the form of a straight line from the lower-left corner to the upper-right corner would represent a completely equal distribution of income, that is, a situation in which every player receives the same salary. Inequality in the income distribution shows up as a "bulge" in the Lorenz curve.

The graphs indicate that baseball salaries are not equally distributed; both Lorenz curves bulge. In order to determine the degree of inequality in a Lorenz curve, one can calculate the area of the "bulge" relative to the total area below the line of income equality. This is called the Gini coefficient. The larger the Gini coefficient, the more unequal is the salary distribution; a Gini coefficient of 1 would represent complete inequality (one person earns all of the salary), and a Gini coefficient of 0 would represent complete equality of the salary distribution. Table 6.10

Table 6.10
Gini Coefficients, Baseball 1965–1974, 1976–1977, 1986–1991

Year	*Gini Coefficient*	*Percent Change from Previous Year*
1965	.363	—
1966	.327	− 9.9
1967	.350	+ 7.0
1968	.338	− 3.4
1969	.347	+ 2.7
1970	.328	− 5.5
1971	.350	+ 6.7
1972	.370	+ 5.7
1973	.369	− 0.3
1974	.395	+ 7.0
Avg. reserve clause years	.354	
1976	.373	− 2.8[a]
1977	.457	+22.5
Avg. transition years	.415	
1986	.488	+ 0.8[b]
1987	.504	+ 3.3
1988	.494	− 2.0
1989	.529	+ 5.0
1990	.508	− 4.0
1991	.539	+ 6.1
Avg. free agency years	.510	

[a]On an annual average basis over the two years between 1974 and 1976.
[b]On an annual average basis over the nine years between 1977 and 1986.

reports Gini coefficients for baseball for the three periods, reserve clause, transition, and free agency. The average Gini coefficient during the 1965–1974 reserve clause era was .354; during the 1976–1977 transition period, it rose to an average of .415; and over the 1986–1991 period, the average Gini coefficient was .510. A recent undergraduate text (Byrns and Stone 1992, 808–811) reports that for the U.S. population, the Gini coefficients for income distribution in 1986 were .389 for families and .443 for unrelated singles (both values are high; those for other industrialized countries tend to cluster around .300 to .350). The clear conclusion is that income inequality in the rest of the U.S. economy, although high relative to other countries, pales in comparison to the inequality in recent years in baseball salaries.

It is also clear that baseball salaries have become less equally distributed over time, and skewed toward the top of the salary scale, with a noticeable jump between the reserve clause and free agency periods—a 22 percent increase in the Gini coefficient between 1976 and 1977. Overall, from the baseball salary data, we can conclude that while all players benefited from free agency, a disproportionate share of the benefits went to the top players, who were the big gainers from free agency. Players at the lower end of the distribution, still held captive by united mobility for their first six years, lost ground relative to their star teammates.

Table 6.11 provides a comparison between baseball and the other sports, over a three-year period for which data were available, 1988 through 1990. One of the striking things about this comparison is that the level of salary inequality in hockey was far less than the inequality in baseball salaries that were observable *during the reserve clause period*. Football salary inequality approximated the inequality in baseball just before free agency became the rule, and basketball inequality was only a bit higher than the inequality in baseball just before the advent

Table 6.11
Salary Inequality across Professional Sports Leagues (Gini Coefficient)

	1988	*1989*	*1990*
Baseball	.494	.529	.508
NFL	.411	—	—
NBA	—	.427	—
NHL[a]	—	—	.284

[a]Salaries of some players for Canadian teams, reported in Canadian dollars, were adjusted at the rate of $1 Canadian = U.S. $0.86 (the June 1, 1990, quote in the *Wall Street Journal*).

of free agency. This pattern is consistent with a ranking of the sports in terms of the degree of free agency (labor mobility) enjoyed by players in the sport. Baseball has the highest degree of player mobility, followed by basketball. Football is still struggling for most of the fruits of free agency, and hockey enjoys nearly none, still stifled under its own version of the Rozelle rule. In turn, the degree of free agency reflects the relative strengths of the players' unions in the various sports, with the Major League Players' Association the strongest union, and the National Hockey Players' Association the weakest.