

# NATIONAL PASTIME TO DISMAL SCIENCE: USING BASEBALL TO ILLUSTRATE ECONOMIC PRINCIPLES

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## INTRODUCTION

As player agents and baseball owners discuss salaries and performances, economists watch, writing down numbers, analyzing the benefits and costs of the owners' and players' actions and settlements. Baseball is a rich playing field for the study of economic principles.

To learn economics, students need compelling (fun!) examples. Baseball provides such illustrations of economic principles. Students already have a more sincere excitement and deeper knowledge of the baseball industry than, for example, aluminum cans. This involvement facilitates learning.

Baseball outcomes connect economic theory to human behavior in many ways. First, the individual performance of a baseball player can be measured. In fact, baseball was the *first* industry in which researchers could actually measure the incremental contribution of an individual employee to total company revenue.<sup>1</sup> Second, the relationship between inputs (i.e., individual performances) and outputs (winning percentage) is predictable. Third, and best of all for economists, skills can be traded. What other industry provides measurable productivity, clear linkage between inputs and outputs, and possibilities of exchange? In addition to the basic components of the theory of the firm, major league baseball illustrates a variety of major topics in microeconomics: collusion, antitrust, salary determination, monopsonistic exploitation, the role of unions, and the economics of discrimination.

This paper explores the unique role that baseball could play in teaching economics. It provides (1) four original examples of how baseball can be used to enliven the teaching of economics, (2) an extensive course outline for principles of economics, with annotations that refer to exciting events and personalities, and (3) an extensive list of stimulating and timely references for a special topics course on the economics of baseball. Should a professor wish to develop a topics course on the economics of baseball, the collection of scholarly research listed in this paper can serve as a springboard.

## BACKGROUND ON BASEBALL AS A PRODUCT AND AN INDUSTRY

Baseball is an industry, with its product being the game and its relationship to a division championship. The product is consumed by fans through attending games, listening to the broadcasts, or checking boxscores and team standings in the media.

The inputs are the players, the manager and coaches, and the stadium. This is all produced by a single firm, but only *in league* with other teams.

### Consumption Value

The entertainment value of baseball derives from the following game attributes:<sup>2</sup>

1. **Uncertainty of outcome.** The winning percentages of the division leaders are the lowest in professional sports. In this respect baseball is particularly striking;
2. **Entertainment value** distinct from the uncertainty of outcome. The colorful personalities and outstanding performances of individual players are an attraction for many fans;<sup>3</sup>
3. Pleasure in relating to a **team victory**;
4. Pleasure in relating to a team's **divisional standing**.

### Institutional Constraints

There are institutional restrictions on both the inputs and outputs that enter the economic analysis of baseball which on the input side include

1. the maximum number of players per team is 25,
2. there is no entry into this industry without the consent of existing team owners,<sup>4</sup>
3. there are territorial restrictions on the movement of existing teams from one city to another, as well as on the location of new teams, and
4. teams own the player contracts for the first six years of a player's tenure in the major leagues.<sup>5</sup>

Constraints on output include

1. a fixed number of teams;
2. a fixed number of games per year (dictated primarily by weather and the seasonal interest of fans); and
3. a fixed number of seats in a stadium.

### Decision-making Factors

Optimal baseball management decisions require the balancing of revenue against costs for different scales of operations. There are three sources of revenue in addition to ticket sales: (1) sale of television and radio broadcast rights, (2) concession sales at the game, including parking, and (3) royalty rights to team logos, etc. Salaries and benefits of players and administrative support staff are the biggest

costs. Additional costs include rent for use of stadium, subsidies to minor league teams, and spring training expenses.

In addition to the baseball game itself, a related business, dealing in baseball player trading cards, can be treated as an adjunct of the baseball industry. This includes not only current season cards but collectible cards from previous years. In discussing the current year, the emphasis will be on the *publishers* of the cards (Topps, Fleer, Donruss, Score, Upper Deck, etc.). For older cards, the focus will be on the *dealers* (those who trade or sell baseball cards, either professionally or as a hobby).

Baseball trading cards are included as part of the baseball industry to provide an example of perfect competition and unrestrained production in an industry otherwise dominated by monopoly elements. Manufacturers can produce as many current year cards as they wish. Market supply and demand dictate the price and output. For collectible cards of previous years, dealers can enter or exit the collectible card industry easily and at low cost; the conditions for perfect competition are approximated.<sup>6</sup>

### USING BASEBALL TO TEACH ECONOMICS: FOUR EXAMPLES

#### Example 1: The Production Possibility Curve

Resources can be used to produce more than one output. Because the supply of inputs is limited and demand is nearly unlimited, choices must be made. In baseball these production possibilities include the choice between winning the division this year or next year.

Most teams have a mixture of inexperienced and veteran players, and the quality of these players is not uniform across teams. In any given year a team that has a realistic chance to win its division may acquire veteran players at the expense of younger players. For example, the 1990 Oakland Athletics acquired one-time All-Star Harold Baines from the Texas Rangers in late August to become their designated hitter during their successful pursuit of the league championship. To obtain his services, the Athletics gave up two minor league pitchers. Other late season additions for contenders in the past decade include Cesar Cedeno, Sparky Lyle, and Rick Honeycutt.<sup>7</sup>

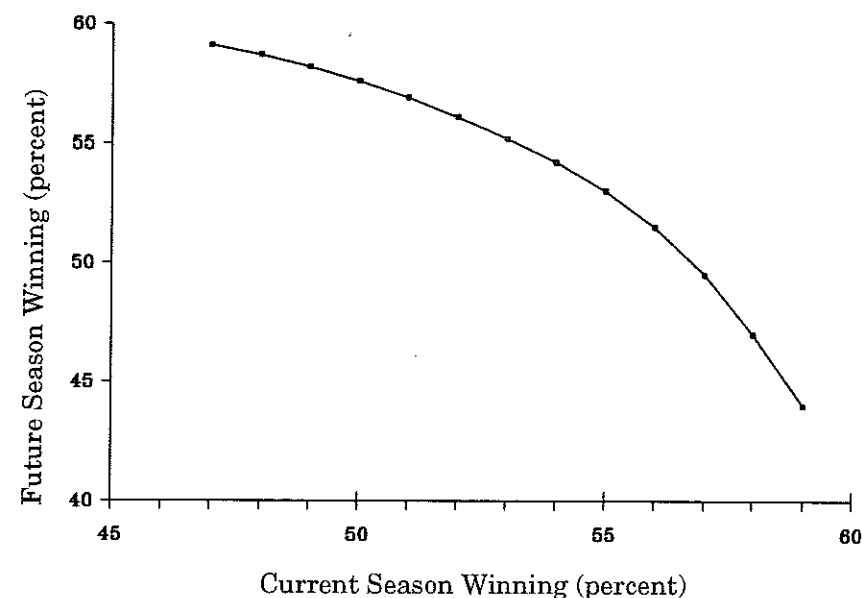
On the other hand, a team that does not have a realistic chance of winning its division in the coming year may reconcile itself to rebuilding and acquire younger players instead of veterans. A recent illustration of this strategy is the 1989 Chicago White Sox, who decided not to resign such veteran starters as Floyd Bannister, Rich Dotson, and Harold Baines, but to go with a youth movement that produced a winning team by the time their new stadium had been built. The 1992 Cleveland Indians pursued a similar strategy. Such decisions can be made halfway through a season. A team that starts a season with some promise of contending, only to fall far behind at the mid-season mark, may postpone their hopes for improvement to the next season and bring up some minor league players to evaluate their potential.<sup>8</sup>

**TABLE 1**  
**Production Possibility**

Winning Percentage Current Season	Winning Percentage Future Season	Opportunity Cost of Additional Current % Victories in Units of Future % Victories
47	59.1	--
48	58.7	0.4
49	58.2	0.5
50	57.6	0.6
51	56.9	0.7
52	56.1	0.8
53	55.2	0.9
54	54.2	1.0
55	53	1.2
56	51.5	1.5
57	49.5	2.0
58	47	2.5
59	44	3.0

Thus baseball teams confront a range of choices between current and future victories, given finite resources and rosters of fixed size, as illustrated in Table 1 (numbers are rounded). The choices shown in the table are plotted (and made continuous) in Figure 1. This example illustrates the production possibility concept and the rising opportunity costs of current (as opposed to future) victories. As shown in Table 1 and Figure 1, a team that concentrates on the current season may very well be sacrificing victories in future seasons when it acquires veteran players at the twilight of their careers. The opportunity cost of an extra percentage point in winning for the current season rises with the total winning percentage. Opportunity cost increases due to the specialization in inputs. Some inputs (rookies) are best suited for future victories while for others (veterans) the time horizon favors current victories.

The production possibility curve can shift outward if team owners make an all out effort to win a pennant by committing more resources (e.g., adding more farm teams, signing more free agents). On the other hand, the curve can shift inward if team owners choose to lower expenses by refusing to resign high salary All-Stars. Teams in big city markets like the New York Yankees and the New York Mets are more likely to do the former while teams in small city markets like Pittsburgh are more likely to do the latter. This is due to the greater revenue per team winning percent found in big-city markets [Scully, 1989].

**FIGURE 1**

### *Example 2: Two Party Exchange and Pareto Optimality*

Frequent exchanges such as buying hot dogs at the ballpark involve little negotiation. However, infrequent and high value exchanges often require involved negotiations between the two parties. Examples of the latter are player trades and the signing of free agents and draftees. Nonetheless, the same considerations govern these transactions: (1) willingness to pay for a good or service depends on its marginal value, and (2) marginal value declines as more and more of the good or service is obtained.

Consider these trade negotiations between two major league teams involving minor league players. The Yankees are interested in obtaining more pitchers and the Dodgers more hitters. When one team has an abundance of quality hitters but few promising pitchers in its farm system, the extra value of an additional hitter declines. On the other hand, a team with a large number of fine young pitchers will place less and less value on new pitching prospects. Pareto optimality occurs when all opportunities for mutually beneficial trades are exhausted.

Table 2 indicates that the surplus of minor league hitters will encourage the Yankees to trade as many as six for one pitcher, five more for a second pitcher, and four for a third pitcher. As more pitchers are acquired by the Yankees, the value of another pitcher declines. For the Dodgers, giving up more and more pitchers will raise the value of remaining pitchers because they become more scarce. Therefore, to give up even more pitchers, the Dodgers will demand an increasing number of minor league hitters in trade. They are willing to give up their first pitcher for two

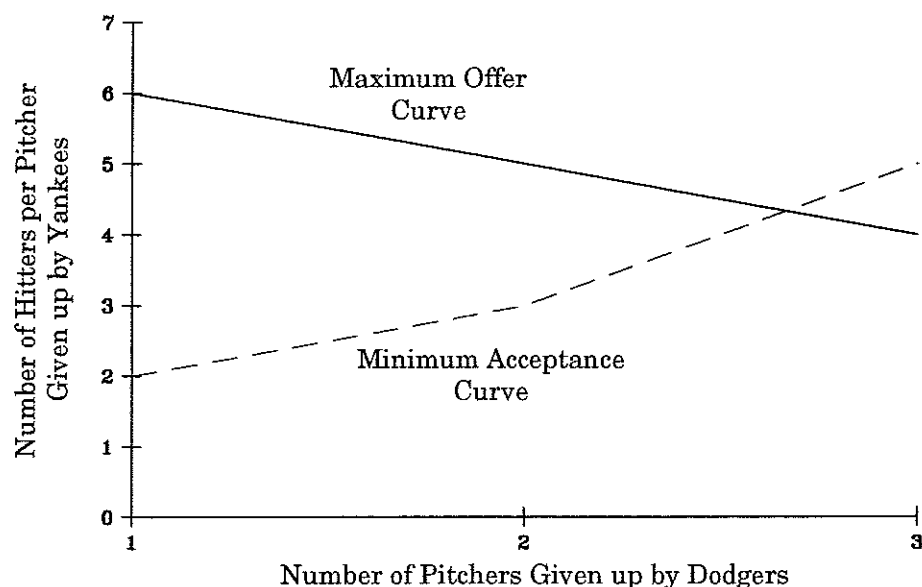
**TABLE 2**  
**Trade Between Two Major League Teams**

Number of Pitchers received by Yankees	Maximum Number of Hitters Willing to Trade for Pitchers	Marginal Value of an Extra Pitcher
0	0	-
1	6	6 hitters
2	11	5
3	15	4

Number of Pitchers Given Up by Dodgers	Minimum Number of Hitters the Dodgers Want	Marginal Cost of Pitcher Given Up
0	0	-
1	2	2 hitters
2	5	3
3	10	5

**FIGURE 2**



hitters, but demand three and five hitters for the next two, respectively. In Figure 2 the Yankees' willingness to trade is illustrated by the maximum offer curve and the Dodgers' willingness by the minimum acceptance curve. Trades will take place whenever the maximum offered is above the minimum accepted.

Either curve can *shift* as the trading deadline approaches and teams reassess their chances of winning the division. For example, if the Yankees believe they have a more realistic prospect of winning, the demand for pitchers will increase (shift outward) as they seek to bolster their pitching staff for the race.

**Example 3: Marginal and Total Product Curves: Law of Diminishing Returns**

A baseball firm's short-run production function for the theory of a firm has a set of fixed inputs (one stadium, nine starting players, twenty-five players on a roster) and one variable input (number of star players on a team). As more star players are added by signing free agents, total product (winning percentage) increases first at an increasing rate but eventually at a decreasing rate. One star player does not help a horrendous team very much; by himself Kirby Puckett could not do much if he were added to the roster of the Cleveland Indians. A second and third star add incrementally *higher* amounts to team winning percentages because, in combination with the others, the jump in quality is significant. When a good fielding shortstop and a top-notch second baseman are added, the team acquires a dependable double-play combination as well as two good individual players. When the lineup contains two power hitters, opposing pitchers are less likely to walk the first intentionally. These are examples of rising marginal product. However, if more and more stars are added and the team's winning percentage is already high, the increments become smaller and smaller. When every position is covered by a star player and the pitching staff has four first-rate starters and an ace reliever, fixed inputs limit the marginal contributions of additional stars (they cannot all play at once). This is why you will not find a team with two outstanding late-inning relief pitchers. No team will benefit greatly by having both Dennis Eckersley and Tom Henke, two of baseball's premier relievers, in the same bullpen. This illustrates the law of diminishing returns (Table 3 and Figure 3).

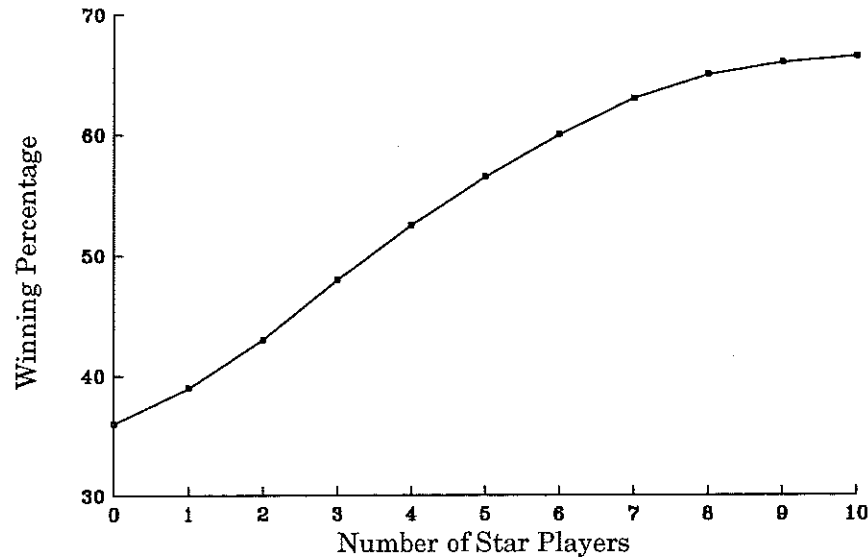
The first column lists the number of star players on a team. The second indicates that total product rises rapidly at first, but then more slowly. The last column in Table 3 shows a rising and then falling (though still positive) marginal product. In Figure 3 the table values are made continuous. The law of diminishing returns is described by the falling marginal product curve in Figure 3B.

This example can be easily extended to see how a firm can decide on the quantity of an input that is consistent with the maximization of its profits.<sup>9</sup>

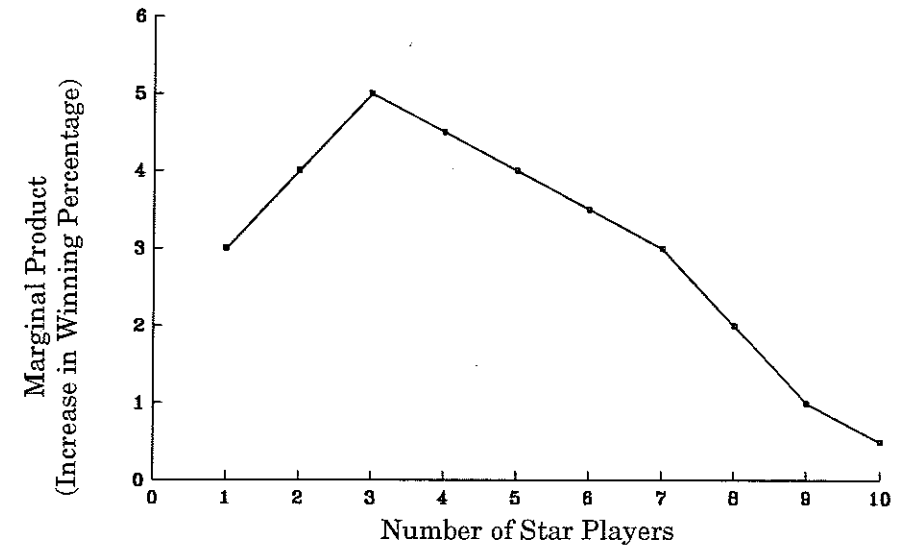
**TABLE 3**  
**Law of Diminishing Returns**

Variable Input Number of Star Players on the Roster	Total Product Winning Percentage	Marginal Product Increment in Winning Percentage
0	36	-
1	39	3
2	43	4
3	48	5
4	52.5	4.5
5	56.5	4
6	60	3.5
7	63	3
8	65	2
9	66	1
10	66.5	0.5

**FIGURE 3A**



**FIGURE 3B**



**Example 4: Marginal Cost and Supply**

In the theory of the firm production functions are the technological basis of cost functions. The law of diminishing returns causes short-run marginal costs of a baseball team to rise rapidly. Assume that \$2 million is the average salary of a star player.<sup>10</sup> This information enables us to calculate a marginal cost curve (Table 4). Its rising portion is the team's short-run supply curve (Figure 4).

We now have seen how baseball examples can be employed to illustrate the most basic principles of price theory. Instructors can create examples from major league baseball and avoid industries that students find unfamiliar or uninteresting.

**THE LINEUP: COURSE OUTLINE FOR PRINCIPLES OF MICROECONOMICS WITH ANNOTATED BASEBALL EXAMPLES**

Based on the suggestions in the course outline, professors can create their own baseball examples. The references can be used to enhance the illustrations with results from actual studies.

**I. The Economic Approach**

**A. Economic way of thinking**

Consider the benefits and costs of televising one more home game on the local networks. According to Henry Demmert, an additional broadcast will

TABLE 4  
Marginal Cost of Star Players

Labor Input <sup>a</sup>	Total Product <sup>b</sup>	Marginal Product <sup>c</sup>	Marginal Cost <sup>d</sup>
0	36.0	-	-
1	39.0	3.0	$\$2,000,000/3.0 = \$ 666,667$
2	43.0	4.0	$\$2,000,000/4.0 = 500,000$
3	48.0	5.0	$\$2,000,000/5.0 = 400,000$
4	52.5	4.5	$\$2,000,000/4.5 = 444,444$
5	56.5	4.0	$\$2,000,000/4.0 = 500,000$
6	60.0	3.5	$\$2,000,000/3.5 = 571,429$
7	63.0	3.0	$\$2,000,000/3.0 = 666,667$
8	65.0	2.0	$\$2,000,000/2.0 = 1,000,000$
9	66.0	1.0	$\$2,000,000/1.0 = 2,000,000$
10	66.5	0.5	$\$2,000,000/0.5 = 4,000,000$

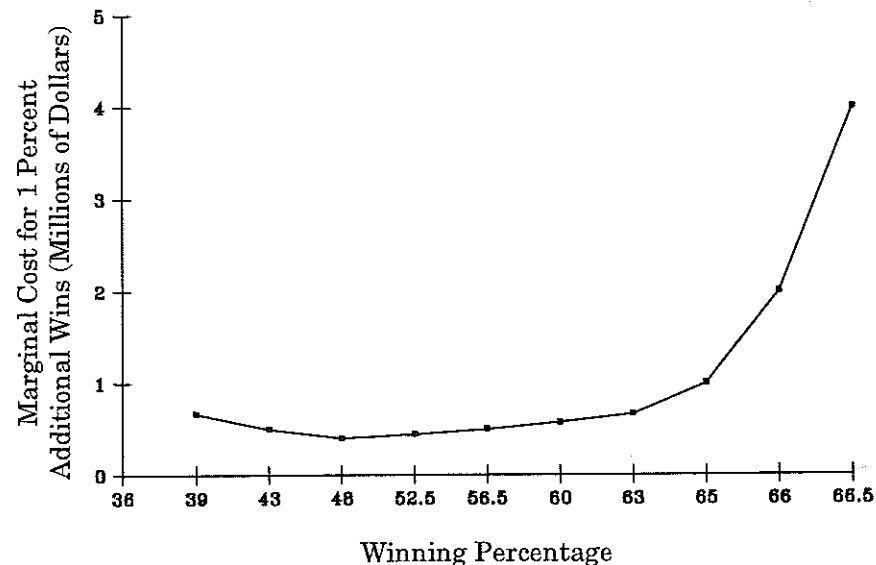
<sup>a</sup> Number of stars

<sup>b</sup> Winning percentage.

<sup>c</sup> Increase in percentage.

<sup>d</sup> For 1 percentage point increase in percentage.

FIGURE 4



reduce home attendance by an average of 4000 fans. This will lower profits from gate receipts and concession sales. The lost profits are the cost of an additional broadcast. A first approximation of the benefits is the additional profit the club receives from the television network. If the profit from the additional broadcast outweighs the lost profit from lowered attendance, we can expect to see another televised game [Demmert, 1974, 69-70].

#### B. Scarcity and choice: opportunity cost

What was the cost of using Babe Ruth as a hitter rather than a pitcher? Was the Babe more valuable as a pitcher capable of winning 20 games a season? [Scahill, 1990, 402-10].

#### C. Production possibility curve

Teams have production possibilities curves for current versus future seasons (see Example #1 on page 277).

### II. Two Party Exchange

A team with a surplus of pitchers will do well to trade with a team that has an abundance of hitters (see Example #2 on page 279).

A baseball trading card collector will find shared advantages with another collector as they exchange duplicate cards.

### III. Demand

#### A. Market demand

The market demand for baseball tickets during a season is increased by market size, team winning percentage, the probability of winning a championship, and income per capita in the metropolitan area [Scully, 1989, 101-16; Whitney, 1988, 703-24].

The market demand for collectible trading cards is increased as the number of hobbyists and collectors grows, and as more investors consider trading cards as an alternative to the stock market [Kare and Jennings, 1991, 7-10].

#### B. Elasticity of demand

In a study of the 1984 season, a \$1 increase in the price of a ticket was associated with a reduced annual attendance of 172,000. The estimated price elasticity of demand for tickets was -0.63, which suggests that owners

could have increased revenue in the short run by raising ticket prices [Scully, 1989, 113-16; Demmert, 1974, 68-69]

#### IV. Supply

##### A. Inputs, outputs, and production functions

Is hitting more important than pitching for winning baseball games? Much more, according to a study by Charles E. Zech [Zech, 1981, 19-23].

Does managerial input have anything to do with winning ball games, or was Earl Weaver just lucky? Studies have shown that managers can make a difference (you need not tell New York Yankee owner George Steinbrenner about this one) [Clement and McCormick, 1989, 287-304; Porter and Scully, 1982, 642-50].

##### B. Marginal and total product curves: law of diminishing returns

A team production function for winning follows the same pattern as a business firm's production function (see Example #3 on page 281).

##### C. Marginal costs and market supply

The marginal cost of winning for a baseball team exhibits the same pattern as an ordinary business firm's marginal costs (see Example #4 on page 282).

#### V. Market Equilibrium

The price for Mickey Mantle's 1952 rookie card declined from \$3000 in 1979 to \$500 during the 1981 recession. A mint card recently sold for \$49,000 as the interest in baseball memorabilia grew [Peers, 1991; Reif, 1991].

#### VI. Price Taker Markets: The Case of Perfect Competition

##### A. The conditions for perfect competition and contestability

New collectible baseball card dealers can easily set up retail outlets or join existing hobby stores and card shows. All that is required is a collection of cards (they need not even be your own). Exit is also nearly effortless. [Kirk, 1990, 95-99.]

##### B. Decision-making for the competitive firm

The number of collectible baseball card dealers is growing as baseball popularity reaches all-time highs. As expected dealer profits grow, entry

will occur in this competitive market. In 1975 there were fewer than 100 card dealers in the country, but entry into the industry has increased this number to over 25,000 in 1991 [Reif, 1991; Brady, 1986].

Baseball trading cards are taking on a dazzling new look as upstart companies enter the industry. For many years only the Topps Company manufactured baseball cards. But now Donruss, Fleer, Score, Upper Deck, and O-Pee-Chee have entered this profitable industry [Levy, 1992].

#### VII. Price-Searching Markets: The Case of Monopoly

##### A. The conditions for price-searching

The number of major league teams and movement of a team from one city to another is highly restricted by the existing teams. In most cities teams have a monopoly on professional baseball [Scully, 1990, 13-28].

##### B. Decision-making for the price-searching firm

A baseball team monopoly that seeks to maximize profits should set ticket prices so that marginal ticket revenue equals marginal cost [Salant, 1992, 77-90].

Do former baseball greats charge profit-maximizing prices for their autographs at card shows?

##### C. Antitrust cases involving charges of illegal monopoly

In 1981 Topps was found guilty of monopolizing the baseball card industry in the 1960's by using its preferred status to sign exclusive contracts with players [Kirk, 1990, 54-56; Vernon, 1992, 91-106].

The National and American Leagues were charged with monopolizing professional baseball teams by the rival Federal League in 1922. The National League destroyed the Federal League by buying some of the teams and inducing others to quit. The major leagues were found not guilty because the courts decided that baseball was not a business, and therefore not subject to the nation's antitrust laws! [Scully, 1989, 26-27].

Should we allow baseball team expansion into big city market without current restrictions? How would the ticket prices of the Mets and Yankees be affected by the entry of two or three new teams into the New York market area? [Ross, 1991, 152-74].

#### VIII. Supply and Demand for Labor

##### A. Determination of the marginal revenue product of labor

It is possible to estimate the marginal revenue products of different quality levels of players (as well as individual players). Hitting perfor-

mances are related to team victories and team victories to attendance and revenue. These can be compared to actual salaries to determine whether baseball players are paid too much or too little [Scully, 1989, 151-70; Zimbalist, 1992, 109-33].

#### B. Monopsony power and collusion

Because owners have exclusive rights to players until they attain free agent potential (after six years in the major leagues), they can pay less than their marginal contributions to team revenue [Medoff, 1976, 113-21; Sommers and Quinton, 1982, 426-36].

In the 1986-88 seasons, the owners colluded with each other to not sign the available free agents. A player had to sign with his old team at 20-30 percent less than what he would have earned without collusion [Bruggink and Rose, 1990, 1029-43].

#### C. Racial discrimination in baseball

Do black and Hispanic players face discrimination in salary, playing positions, and trading card values? Not everyone agrees, but the answers seem to be no, yes, and yes [Christiano, 1988, 136-49; Medoff, 1986, 297-304; Nardinelli and Simon, 1990, 575-95].

### IX. Labor Unions and Collective Bargaining

The Major League Players Association was formed to address issues of pay, pension, and working conditions. Its weapon is the power to strike [Kerr, 1991, 115-34; Voigt, 1991, 95-114].

### X. Capital, Interest and Profit

The expected flow of future profit generates the value of a baseball club for sale. Rising attendance and broadcast revenues are now pushing the sale price as high as \$200 million for the New York Yankees and \$170 million for the Los Angeles Dodgers [Johnson, 1992; Scully, 1989, 143-44].

Expansion teams cause existing teams to lose profits as their share of network broadcast revenues declines and home attendance is hurt by the low quality play of the new teams. The lost profits are made up in the franchise fees that expansion teams must pay to join the major leagues [Stevenson, 1990; Helyar, 1990].

According to statistical evidence provided by Dilip Kare, there is a steady relationship between the age of a collectible card and its value. With this long term trend, there is no one "best" year to sell a card because your expected rate of return will be the same over any fixed time period [Kare and Jennings, 1991, 7-10; Mazer, 1988].

### EXTRA INNINGS: SPECIAL TOPICS COURSE ON THE ECONOMICS OF BASEBALL

Another use of scholarly research on our national pastime is to create a special topics course in applied microeconomics called the Economics of Baseball. The following topics could be considered in a major league setting: (1) attendance and the demand for baseball, (2) production functions, (3) pay and performance, (4) monopsonistic exploitation and collusion, (5) the effects of free agency on the viability of teams and markets, and (6) racial discrimination. The Appendix lists references, arranged by topic, that could be the basis of a reading list for such a course.

### CONCLUSION

Economists have treated baseball as a subject of research for thirty-five years. The list of more than 80 journal articles and books that cover a wide range of economic topics can provide examples for all subject areas in a Principles of Microeconomics course or a special topics course on the economics of baseball.<sup>11</sup> For the economic concepts that have not been the subject of research, instructors need to experiment with their own examples, as I have shown in this paper. The rewards can be enormous. The connection between economic theory and human endeavors can be made more enjoyable by using baseball rather than aluminum cans as the paradigm. By relating subject matter to student interests, students can be motivated without sacrificing rigor.



## APPENDIX

Additional References for a  
Special Topics Course on the Economics of Baseball

## 1. Attendance and the Demand for Baseball

- Domazlicky and Kerr, 1990, 62-68  
 Marcum and Greenstein, 1985, 314-22  
 Porter, 1992  
 Siegfried and Eisenberg, 1980b, 34-41
- Hill, Madura, and Zuber, 1982, 31-35  
 Noll, 1974  
 Siegfried and Eisenberg, 1980a, 59-69  
 Whitney, 1988, 703-24

## 2. Production Functions

- Clement, 1989, 287-304  
 Porter and Scully, 1982, 642-50
- Irving and Goldstein, 1990, 23-27

## 3. Pay and Performance

- Bennett and Flueck, 1983, 76-82  
 Daly, 1992, 11-28  
 Fort, 1992, 134-162  
 Hill and Spellman, 1984, 103-12  
 Krohn, 1983, 273-79  
 Raimiondo, 1983, 183-93  
 Scully, 1974, 915-30  
 Zimbalist, 1992
- Chelius and Dworkin, 1982  
 Dworkin, 1986, 63-69  
 Hill, 1985, 68-82  
 Krautman, 1990, 961-66  
 Lehn, 1984, 37-44  
 Rottenberg, 1956, 242-58  
 Sommers and Quinton, 1982, 426-36

## 4. Monopsony Power and Collusion

- Bruggink and Rose, 1990  
 Hopper, 1977, 25-36  
 Medoff, 1976, 113-21  
 Shapiro, 1978, 191-208
- Durland and Sommers, 1991  
 Martin, 1972, 567-71  
 Morris, 1973, 85-98

## 5. Effect of Free Agency on Viability of Teams and Markets

- Cassing and Douglas, 1980, 112-21  
 Daly and Moore, 1981, 77-95  
 Drahozal, 1986, 113-21  
 Hunt and Lewis, 1976, 936-43
- Crymrot, 1983, 545-56  
 Dolan, 1985, 21-31  
 Holahan, 1978, 129-37  
 Quirk, 1973, 8-10

## 6. Racial Discrimination in Baseball

- Christiano, 1988, 136-49  
 Johnson, 1992, 189-202  
 Klein, 1989, 95-112  
 Leonard, 1988, 278-84  
 Medoff, 1975, 37-44  
 Pascal and Rapping, 1972, 119-56
- Gwartney and Haworth, 1974, 873-82  
 Kahn, 1992, 163-188  
 Leonard, et al., 1988, 31-43  
 Medoff, 1986, 297-304  
 Nardinelli and Simon, 1990, 575-95  
 Phillips, 1983, 1-17

## NOTES

This paper benefitted greatly from the helpful comments by James W. Eaton of Bridgewater College, and the referees and editor of this journal. A shorter version of this paper appeared in the January 1993 issue of *Elysian Fields Quarterly*, a scholarly baseball review.

- The economics of the baseball labor market was first analyzed in the seminal article by Simon Rottenberg [1956]. The first article on pay and performance in baseball was written by Gerald Scully [1974].
  - For an extended discussion on the product of sports teams, see Demmert [1974, 10-11].
  - Baseball is distinct from other professional team sports, because of its focus on asymmetrical confrontations between offense and defense. A batter faces, on his own, nine defensive players each time he steps up to the plate. A runner faces the same on the basepaths. All fielders are positioned to defend a territory on their own. This highlights individual performances.
  - Baseball is unique among professional sports in that it is the only sport exempted from our nation's antitrust laws. This favored status was granted by the Supreme Court in *Federal Baseball Club of Baltimore v. National League et al.* [259 U.S. 200 (1922)]. Chief Justice William Howard Taft, once a Yale University baseball player, declared that baseball exhibitions were not commerce in the commonly accepted use of the term. In 1972 Supreme Court Justice Harry Blackmun described this decision as an anomaly and an aberration, in the Curt Flood case, and in 1993 U.S. Representative Michael Bilirakis, a Republican from Tampa, Florida, intends to introduce legislation to repeal the exemption. See Anderson [1992].
  - Under Article XVIII of the 1976 and 1980 Basic Agreements, baseball clubs have the right to exclusive contracts for their players. Free agency is granted to players after six or more years of major league service, at which time they are free to negotiate with any team they choose.
  - Because the standards for perfect competition are seldom attained, some economists have recognized that markets can be *perfectly contestable* without a large number of sellers, provided that entry and exit occurs at low cost. This certainly would be the case for baseball card dealers.
  - Back in the 1940s and 1950s, late season additions included such well-known players as Enos Slaughter, Sal Maglie, Dale Long, and Johnny Mize. For a more complete list see Associated Press [1992].
  - This scenario is described by Michael Martinez [1992].
  - An example will show how to determine the optimal quantity of a variable input (number of free agent star players) for a baseball team, based on the data in Table 3. The marginal revenue product (MRP) of the labor input is found by assuming that each additional winning percentage point is worth \$700,000 to the team in annual revenue. Multiplying this value by the marginal product for labor in Table 3 provides the table shown below. If we assume that a free agent costs, on the average, \$2 million in annual salary, the optimal number of inputs is seven.
- | Labor Input | MRP         |
|-------------|-------------|
| 1           | \$2,100,000 |
| 2           | 2,800,000   |
| 3           | 3,500,000   |
| 4           | 3,150,000   |
| 5           | 2,800,000   |
| 6           | 2,350,000   |
| 7           | 2,100,000   |
| 8           | 700,000     |
| 9           | 350,000     |
- With players like Roger Clemens, Bobby Bonilla, and Ryne Sandberg making upwards of \$5 million a year, the \$2 million base salary for a star player may seem low.
  - Readers can write to the author for a list of these references.

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