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THE IMPACT OF THE ELIMINATION OF THE RESERVE CLAUSE ON DOMINATION, ECONOMICS, AND LABOR-MANAGEMENT RELATIONS IN MAJOR LEAGUE BASEBALL

A Thesis
Presented for the
Master of Science
Degree
The University of Tennessee, Knoxville

Jack Walton Hewett
August 1997

ACKNOWLEDGEMENTS

There are many people to whom I am grateful to at the University of Tennessee. I have benefited greatly from knowing the faculty and graduate students in the Sport Management program over the last three years. I am particularly grateful to my Thesis Committee, Dennie Kelley, Patricia Beitel, and Patsy Boroviak. They have read numerous revisions and provided useful insight to this thesis.

I would like to thank my parents, John and Karen, who instilled in me the confidence to achieve this goal.

ABSTRACT

In this study three major issues in Major League Baseball are examined for the effect of what the elimination of the reserve clause had upon them or caused them to be created. These issues were domination, economics, and labor-management relations. Regression analysis on home and away attendance equations used by Hunt and Lewis (1976) was compared to current regression conducted on these equations. Correlation coefficients for the variables in this study's equations were also conducted. A dominance statistic was also calculated and compared to Hunt and Lewis' findings. The findings on the home and away attendance equations found significant changes in the regression analysis. Correlation coefficients of these variables were found to have logical effects on home and away attendance. Domination was found to have decreased after the elimination of the reserve clause. The conclusion was that domination, as feared by the advent of free agency, was not baseball's main problem. Through the studies in the literature it can be demonstrated that baseball's main concern is free agency and its effect on labor-management negotiations and inflation of salaries.

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NOMENCLATURE

AATT	away attendance
APOP	average away population
aZ	Z is a vector which includes direct substitutes, per capita income, stadium dummy, price, year in city, and league dummy, and a is a vector of coefficients not reported
FLAG	dummy variable which has a value of two if the team has won a pennant in the last four years, one if the last nine years and zero otherwise
LEAD	average lead of division winner
POP	population of SMSA
SMSA	standard metropolitan statistical area
STAR	number of superstars on team
WGBL	weighted games behind leader with games behind at the end of the season weighted twice and on August 15^{th} weighted once
WGBL-1	games behind leader variable lagged one season

Chapter I

Introduction

The economical aspects of baseball have undergone considerable change with the advent of free agency. This major change led to much strife between labor and management on free agent status and salary arbitration. The beginning of the free agency era with the termination of the reserve clause has been stated as being a direct result of collective bargaining and the formation of the Major League Baseball Players Association (Sloane, 1977). The players have appeared to come out victorious every bargaining session since the elimination of the reserve clause. The owners attempted to collude against the players to combat the player victories in free agency and salary arbitration (Baade and Tuttle, 1991).

These victories by players and actions by owners have undoubtedly had an effect on the player-owner relationship and a subsequent effect on negotiations. Player perception of salary equity could also place a strain on negotiations when a player does not perceive he is receiving fair compensation. Howard and Miller (1993) found that player perception of underpayment correlated consistently with actual underpayment using data envelopment analysis. However, overpayment was also demonstrated by this analysis.

Direct effects of the elimination of the reserve clause can be seen in the player-owner relationship with every bargaining session subsequent to its elimination causing a strike or the threat of one. The impact also can be seen by skyrocketing salaries far above the influence of inflation. However, the indirect relationship this has with the

domination, or lack of domination, which major league clubs have demonstrated should be examined. This study will examine the effects from the elimination of the reserve clause and replicate the home and away attendance equations used in Hunt and Lewis' (1976) study to demonstrate if there has been any significant change in domination.

Statement of Problem

The purpose of this study is to evaluate the effect which the elimination of the reserve clause has had on; a) factors affecting home and away attendance; b)the extent of domination by the large Standard Metropolitan Statistical Area teams; and c) the economics of baseball resulting from the ensuing process of free agency and salary arbitration.

Definition of Terms

The theoretical and operational definitions of relevant terms are listed to provide a better understanding of the information contained in this study.

Basic Agreement- Forming the base or essence in harmony of opinion, action, or character. In this study, it is the contract between the players and owners negotiated every four years.

Collective bargaining- Negotiation between an employer and labor union representatives, usually on wages, hours, and working conditions. Operationally, it is the negotiation between the owners and player representatives on free agency, salary arbitration, salary caps, and other labor issues.

Collusion- Secret agreement or cooperation especially for an illegal or deceitful purpose. In this study, collusion occurred when the owners were found guilty of

conspiring in not signing or offering below-market salaries to those players who were eligible for free agency.

Free agency- A professional athlete who is free to negotiate a contract with any team. Operationally, it is a major league baseball player who, after five years of major league service, is able to contract with any team.

Labor market- A market where labor is negotiated. In this study, the labor market consists of the player representing the labor and the market being major league baseball.

Monopsony- An oligopsony limited to one buyer. Operationally, the owners of the teams had a monopsony by being the only buyer prior to the termination of the reserve clause.

Oligopsony- A market situation in which each of a few buyers exerts a disproportionate influence on the market.

Reserve clause- The clause in a professional athlete's contract that reserves for the club the exclusive right automatically to renew the contract and that binds the athlete to the club for his entire playing career or until he is traded or released. Operationally, the major league owners created the reserve clause in the early stages of baseball to have as much control over players as possible.

Salary arbitration- Salary decided through the hearing and determination of a case in controversy by a person chosen by the parties or appointed under statutory authority. In this study, at a certain time when a player becomes eligible for salary arbitration, he goes to an agreed arbitrator between him and the owner. The arbitrator examines his

statistics and makes a binding decision based on how those statistics compare with other players to determine his salary.

Limitations of the Study

This study's home and away attendance equations were conducted over a four year period compared to Hunt and Lewis' five year period. Another was the expansion by four teams subsequent to their study, with the last two being left out due to only being in existence the last year of the study. Due to insufficient data the aZ variable was omitted from this study.

Delimitation's of the Study

The delimitation's of the study were the 28 teams researched from the years of 1990-1993.

Assumptions of the Study

It is assumed that the elimination of the reserve clause has affected the economics of major league clubs and in turn the degree of frequency of dominance. It is also assumed that free agency and salary arbitration have had a negative effect on player-management negotiations.

Chapter II

Review of Literature

The focus of this review of literature examines the issues and events from the elimination of the reserve clause to the present. Collective bargaining and its genesis is discussed. The impact of free agency and salary arbitration are explained. Labor-management negotiations are reviewed with player and owner strategies examined. Collusion by the owners is reviewed and players' salaries are studied to ascertain if they were over or underpaid.

A consistent topic throughout the review is the elimination of the reserve clause and its effect. This resulted in free agency and salary arbitration which have radically changed the economic aspects of baseball. It is represented in the studies as the main factor in the lengthy negotiations and work stoppages.

At the time Hunt and Lewis' (1976) study was conducted the reserve clause had received considerable attention in the economic theoretical literature and its allocational effect. The reserve clause transferred ownership rights from the player to the team owner. It has been argued that elimination of it would lead to large city teams dominating and therefore ruining the sport. This is not true, however, with property rights being well defined and recontract through sales of players' contracts being permissible and costless, " a labor market with monopsonistic restrictions leads to the same allocation of players and relative team strengths as does a competitive labor market; only the distribution of wealth between players and owners is affected " (Hunt and Lewis, 1976, p.936).

The focus of this study used regression estimates of both home- and away-attendance equations as well as implied opportunity costs of resources to examine empirically the extent of domination by the large Standard Metropolitan Statistical Area (SMSA) teams that could be expected in a competitive player market. This analysis led to some major conclusions by Hunt and Lewis (1976). First, there were no profit incentives for the teams in the large SMSAs to increase dominance to a level that exceeded experience in recent years of the study. Second, an owner whose goal was to maximize dominance over profits might increase dominance to win to a point where the opportunity loss is quite high.

Comparative static experiments were conducted by Hunt and Lewis (1976) to determine how the revenues of the dominant team, the other teams in the division, and total division revenue respond to changes in the level of dominance by the big city team. Team revenue and division revenue sectors were assigned identities to produce data from these studies.

Hunt and Lewis (1976) found revenue for the division to be maximized when the large SMSA team won the division approximately 43 percent of the time, while revenue for the dominant team was maximized at the 80 percent level. For a dominant team to increase its amount of dominance, their marginal cost was calculated using the revenue loss of the other teams in the division. Many variables such as injuries, off years, team dissension, and others changed the attempt of increasing dominance by acquiring new players.

In conclusion, the analysis suggested that the then recontracting market produced a level of dominance over the long run that corresponds roughly to the profit-maximizing level of dominance that would be expected in a perfectly competitive players market. Hunt and Lewis (1976) attributed the lack of domination in the recent years of this study to impediments to recontracting which could disappear if the reserve clause was eliminated. It was stated it could also be attributed to owners not willing to ignore opportunity costs for continually winning pennants. Hunt and Lewis (1976) speculated that the elimination of the reserve clause might affect the distribution of wealth, since the owners would lose the monopsony rents that they presently had.

With the emergence of the Major League Baseball Players Association (MLBPA) being a potent collective bargaining organization, the player-owner relationship was permanently altered. According to Sloane (1977), this change in the control structure did not necessarily benefit the game itself. This change was observed as a possible violation to fans because of the shift in the view of the athlete from a mythic figure to a card-carrying union member. Thus began the growing independence and power of the players.

The MLBPA from its inception advanced the interests of its constituents, the players. This was accomplished by improvements in salaries and benefits. Significant noneconomic improvements were also gained, such as a full-fledged grievance procedure capped by final and binding arbitration by a neutral party and free agency. Above all, Sloane (1977) stated, collective bargaining must be credited with the elimination of the reserve clause.

Past attempts of player organization, i.e., the Brotherhood of Professional Ball Players in 1885, the Baseball Players Fraternity around WW II, and the American Baseball Guild in 1946 were met with failure. There were four major factors for the success of the MLBPA, according to Sloane (1977). First, the MLBPA's executive director, Marvin J. Miller, was well respected and was able to unite players as a whole. Second, the widespread backgrounds and varied philosophies concerning business and the game helped to create mutual suspicion which kept owners from being as well organized as the players. A third factor was the increase in financial gains of the period. With attendance at a high and increasing television deals, owners were prosperous and willing to part with more. Fourth, the general spirit of the time on unionism was expanding outside of the blue collar environment.

Sloane (1977) stated, in conclusion, that the effective union leadership, combined with owner's demonstrated resources, the significant ownership differences and societal developments favorable to collective bargaining outside of baseball, were factors which worked in support of the baseball unionist. Baseball's collective bargaining was compared to the American labor movement and its tradition of advancing the welfare of its jobholders.

The strike of 1981 was the longest work stoppage until the 1994 strike. Debrock and Roth's (1981) study focused on the discontinuous nature of the '81 strike. The test used attempts to show what variables would make this an optimal strategy for the players. A simple variable-threat bargaining was used in the context of baseball.

Debrock and Roth (1981) pointed out that the most important issue in the 1980 contract negotiations was the compensation for free agents. Players had been allowed to become free agents in the previous bargaining session in 1976 when the reserve clause was eliminated. The owners wanted to partially restrict players in the free agent market, which in turn brought opposition from the players. There was a deadlock, and as a result, the players voted to strike at the end of the exhibition season and then play the regular season games until midnight May 22 and resume an indefinite strike if a new Basic Agreement was not finalized.

The bargaining model took the two parties, the MLBPA and the owners, and modeled them as risk-neutral individuals involved in a two-stage variable-threat bargaining game. In the first stage each party chose a threat to be carried out if further negotiations failed to reach an agreement. The second stage was modeled as a fixed-threat bargaining game, where if the payoff is not received in the event of a disagreement, the threats from the first stage would be carried out. Debrock and Roth (1981) used two models to demonstrate different situations. In Model A, the optimal strike threat of the players was derived with the restriction of owners not being able to use a lockout as a response. Model B derived equilibrium conditions for determining optimal strike threats and optimal lockout threats when both are possible.

In conclusion, the models used by Debrock and Roth (1981), with a discontinuous strike being the players' optimal strategy, was in fact the same strategy used by the players. Systematic variation in revenue to management combined with the constant

salary of labor puts extreme importance on the choice of appropriate strike dates in major league baseball.

With the advent of free agency the fans and press were quick to question a player's worth due to possible lack of ambition from the financial security of their long-term contracts. Sommers and Quinton (1982) examined the first family of free agents to see if they did in fact earn their salaries. To aid in this, a modified version of Scully's two-equation model of player marginal revenue product was utilized.

The first family of free agents were numbered at 14 and were signed for approximately $23 million in bonuses, long-term salaries, and deferred payments. In comparing the player's marginal revenue product to his annual contract cost, Sommers and Quinton (1982) found only two free agents failed to generate positive revenue and both player's seasons were cut short due to injuries. A better approach was suggested to subtract from the free agents figures the marginal revenue product for those players on the team who were not free agents. Only four free agents were found to contribute $200,000 more to team worth than other starters in the lineups.

Given these estimates it appeared that this free agent crop was overpaid, however, these results demonstrated that free agents were not as much overpaid as the other players were underpaid. This gap was predicted by Sommers and Quinton (1982) not to last as more players achieved free agent status. In conclusion, this study presented evidence that the free agent class of 1977 was compensated for the ability to put fans in the stands even though the average ballplayer was still grossly underpaid.

Another study on the impact of the elimination of the reserve clause on the salary structure was conducted by Hill and Spellman (1983). This article focuses on the 1976-77 period with 1977 being the first year of free agency. Examined in the article are the effects of the revised system on the length of player contracts and average compensation levels. This is done by compensation determination models and analyzation of data from these between the two seasons. Separate models were used for pitchers and hitters.

Analysis of the data by Hill and Spellman (1983) demonstrated a substantial rise in the number of multiyear contracts of free agents compared to nonfree agents. Also, free agents in 1977 apparently received higher pay than players with comparative ability. Pay was more positively correlated with past performance in 1977 and seniority-based compensation was lower in 1977 than in 1976, particularly for pitchers.

The conclusions from the compensation models implied a three-tier pay scale could emerge in later years. These three tiers being as follows: enhanced salaries from the threat of free agency, competition for free agents, and players still not eligible for free agency. Hill and Spellman (1983) predicted an upward wage spiral from the data and that revisions to the Basic Agreement in 1981 had little effect on slowing this down. In the absence of other controls, only owner constraint could control salaries.

The impact of free agency on the distribution of talent among teams was studied by Drahozal (1986) by testing the effectiveness of the reserve system and comparing it to the free market system. If the reserve system did promote a more balanced distribution of talent, the free agency era would demonstrate the movement of players from small city teams to big city teams. Also, if the reserve system did lead to more equal distribution of

talent, replacing it with free agency should lead to a decline in league balance. Therefore, findings that pennant races had become less close and big city teams more dominant since the advent of free agency would demonstrate the reserve system to be more effective in maintaining balance.

Drahozal (1986) used a sample of 129 professional baseball pitchers and nonpitchers who signed contracts of five or more guaranteed years from 1977 to 1981. Since this sample contained mostly top quality players the results would provide information about the players most important to the league. Simple t tests were used for the player movement hypotheses. On the average, there was no movement of free agents from small cities to big cities. These results suggested that the reserve system did not significantly affect the distribution of playing talent.

The more definitive test was the change in competitive balance following free agency. This was tested by the number of different teams that won league championships (the greater the number, the more balanced the league). Over each six-year period, eight different teams won pennants which reveals no change in league balance. Another measure that was used was the dispersion of team winning percentages, with the lower the variance the more balanced the league. After this test the balance of the American League appeared to decline and the National League to have improved. This test failed to find a consistent decline in league balance following free agency. Drahozal (1986) conducted another test to measure the dominance of big city teams by the correlation between team winning percentage ranks and the population ranks of the cities in which

the teams played. There was no significant increase in big city dominance with none of the coefficients found to be statistically different from zero at the .05 confidence level.

Arguably the most controversial subjects between players and owners has been salary arbitration. Ten years after its origin, Dworkin (1986) assessed its impact on baseball. In reference to the impact on the bargaining process evidence is presented for interpretation. Over the ten-year period 29 percent of the players eligible for arbitration actually filed with an increase to 49 percent in the last five years. This increase was attributed to the players feeling that it was necessary to have this as a threat in order for the owners to negotiate in good faith. Another finding on this impact was that 72 percent of the players who filed for arbitration settled their differences before arbitration. The overall usage of arbitration was at a rate of eight percent overall and 27 percent of the players who filed and eventually had their salaries determined through an arbitration award.

Data was found by Dworkin (1986) which questioned the reasonableness of meaningful compromise in the final-offer procedure of salary arbitration. The average spread (player's final demand-club's final offer) in 1974 was 20 percent of the average player salary which increased to 40 percent by 1985. These figures conclusively demonstrated the widening of the gap between parties instead of the purpose of arbitration to bring them closer together.

Finally, it was demonstrated that the final-offer arbitration process was a no-lose situation for the players. In illustrating this, Dworkin (1986) demonstrated that players in 1985 who lost arbitration still had an average gain of 63 percent. This forced the owners

to at least meet this gain, or increase it, not knowing whether they would win or lose. The threat of free agency was also considered a factor in receiving higher salaries.

In his 1988 study Dworkin (1988) examined the decision making process employed by the arbitrators who decide the cases and also looks at the issue of drug testing. It is suggested that written explanations of the arbitration decisions handed down should be delivered to provide the parties and researchers with important information.

Dworkin (1988) ended with three conclusions on the arbitration process. The first was that it has worked well in getting both parties to bargain in good faith and settle their differences. Secondly, it had not worked well in terms of causing the parties to submit reasonable final offers and final demands. As stated earlier, the process appeared to be a no-lose situation for the players.

The validity of the Elias Sports Bureau ranking system used in arbitration process is questioned by Dworkin (1988), mainly because of career performance not being included and its method of treating players who are on the disabled list for part of a season. It was hypothesized that the highest paid players would be the most highly rated at their position. To test this, player salary, Elias Sports Bureau ratings, and another popular rating system, Run Production Average (RPA) data was collected on 214 players. Both systems were significantly related to salary, with the Elias being negative and the RPA being positive (lower Elias rating = higher rated player, higher RPA = higher rated player). The correlation between the two systems was extremely small and not statistically different from zero. This demonstrated that at the same time of measuring player productivity different factors were used. Dworkin (1988) cites this, along with

previous models having success, stands in contrast to the results obtained in the study relating Elias Sports Bureau ratings to salary.

With revenues not keeping pace with increasing player salaries, owners turned to television to generate larger revenues. Bellamy (1988) examined how the market structure of Major League Baseball (MLB) both affected and was affected by the televising of games with the relation to alternative television outlets explored. Baseball's relationship with the television industry is explained. The product of MLB is described as essentially entertainment, but there is more to the product of MLB due to its competition factor. This ability to produce and maintain competitive equilibrium is related to its being an oligopoly.

The beginning of MLB and its relation to the broadcasting industry in the 1930's produced a major source of revenue for teams through radio and television fees for regional rights, which is discussed by Bellamy (1988). Unlike the NFL plan, where all television money is split equally among the teams, baseball's is much different. In baseball, the network money is supplemented by whatever a team can get for its local rights. This was a major financial boost for teams in the large media markets above teams in the smaller markets. Compounding this disparity, was the way that MLB divided gate receipts which was not as equitable as the NBA or NFL.

Bellamy (1988) states that certain teams have always been able to differentiate themselves in terms of revenues, profitability, and success on the field. It was speculated that alternative television technologies would further weaken MLB by further

differentiating the product. These alternatives specifically being superstations and pay-per-view television.

The movement of teams to these new technologies had primarily been at the local or regional level. At the time of Bellamy's (1988) study five teams had their games broadcast by superstations. This was very controversial within MLB, especially with ownership connections between three of the five superstations and the teams they broadcast. This ensured these teams with the ability to integrate their operations vertically by airing the product without the fear of being outbid by a rival station. In 1985 an agreement was made with superstation teams in which they would contribute money to a central fund that would be evenly distributed among all teams. This was observed as to be only an interim solution and far from solving the problem. With baseball being prevented from a national basic cable package under its current network contract, many teams shifted their emphasis to pay television. After analysis it was stated that pay channels would seem to do little more than increase the television revenue inequity that existed between the teams in large and small markets and further concentrate economic power in a few sellers.

In conclusion, Bellamy (1988) points out that this disparity concentrating power in the hands of an elite few creates barriers preventing more teams from achieving this status, thus further differentiating the teams in terms of revenue generation and eventually playing success. It is observed with network television revenues likely to decrease or at the least stabilize due to a depressed advertising market for sports, revenues from alternative television outlets will become more important. This is examined as a viable

opportunity, but one that must have a nationally coordinated television plan adopted by MLB to have an equitable revenue distribution among teams to maintain its industrial structure and long-term viability.

The 1990 negotiations discussed by Jennings (1990) brought the players wanting to improve free agency and salary arbitration in their favor. The MLBPA's salary arbitration eligibility extension did not meet some members' expectations and did not seem justified by economic considerations. Collusion in salary negotiations with free agents in the 1985 and 1986 seasons brought further distrust of management. The players entered negotiations specifically seeking the return of two-year salary arbitration eligibility, " collusion-proof " contract language, including penalties for infractions, economic gains in minimum salary and benefit plan contributions commensurate with the owners' improved financial situation. The owners and management did not enter negotiations in consensus, with increased payroll spending and escalating salaries being the backdrop to the negotiations.

Jennings (1990) observed prior to these negotiations a record number of free agents were signed with some of them having somewhat modest playing statistics. This indicated to the owners that with healthy player salaries the MLBPA should take a cooperative approach in the negotiations. Management's concerns were focused on revenue sharing and modification of salary arbitration, if not its elimination. The owners, quoted from Jennings (1990):

> proposed a plan that would provide for a guaranteed pool of money, a percentage of the teams' revenues that would go to the players salaries, benefits, health care, and pensions. The plan called for the elimination of the salary arbitration process by providing a special

> salary range for players with zero to six years, based on a performance formula. All 26 clubs were to pay an equal portion of the salary pool for such players. Free agent rules would be altered by restricting clubs with high payrolls from signing outside free agents until lower payroll plateaus were reached. (Jennings, 1990, p. 753).

The owners wanted any possible work stoppage to occur at the beginning of the season because players earn approximately 80 percent of their salaries by August, whereas the owners only have 20 percent of their revenues.

Management's proposal, Jennings (1990) stated, would be a guaranteed amount of money for players and free agents with more than six years of service and players with less than six years would be paid on the basis of performance statistics. This was not embraced by the MLBPA which contended that the proposal's emphasis on performance statistics overlooked certain complexities and intangibles. This resulted in a stalemate and owners locked players out of spring training. After much negotiating over the key issues a new agreement was reached on March 18. Jennings speculated on four general similarities which would likely apply to future negotiations: a) bargaining beyond the contract expiration date, b) lack of total consensus within the labor and management constituencies, c) a paradoxical relationship between public interest and customer influence, and d) unwillingness of the Commissioner to resolve the impasse.

In conclusion, Jennings' (1990) described stage set up a possible shift in professional baseball's collective bargaining from a distributive approach, characterized by conflicts of interest and one party gaining at the other's expense, to a more integrative approach, where both parties attempt to resolve a common problem or concern to their

mutual benefit. It will remain to be seen whether bargaining developments in the 1990 negotiations shift the historically based distributive approach to the integrative approach.

Another examination of salary arbitration is conducted by Jennings, in his book, Balls and Strikes (1990). Arbitration statistics through the 1988 season are calculated and three related conclusions are suggested. First, the number of arbitration cases in the first six years of arbitration (1974-82) and the second (1983-88) six years demonstrate a similar number with the percentage of decisions awarded to players decreasing six percent. Second, players who used arbitration noticed a major increase in salaries and this effect also benefited players who basically ignored arbitration. Third, arbitration encouraged bargaining in the case of those filing for arbitration, but did not seem to have influenced bargaining efforts among those experiencing arbitration. It was observed that far more players filed for arbitration and settled before using the procedure in the years 1983 through 1988 than in the years 1974 through 1982. It is concluded that final arbitration at this point promoted intensive, sincere bargaining between the participants.

Baade and Tuttle's (1991) study analyzed the labor-management dispute of owner collusion against the players. The economics of free agency were discussed in the first section. The second section was over the theory relating to the computation of player marginal revenue products and salaries. In the last section, selected player marginal revenue products are measured and compared to salaries.

The termination of the reserve clause and the subsequent free agent market were identified by the owners to account for their collective losses. This was noted as affecting the increase in the cost of salaries without the owners realizing an increase in revenue.

Baade and Tuttle (1991) implicated these factors as the main affectors to the 1981 strike. The owners sought to regain the power lost to the players who, in turn, wanted a reduction in the number of years required to become a free agent. An experienced player was desired by the owners rather than a draft choice as free agent compensation. The sides could not come to an agreement and the players went on strike. In the mid-80's the owners were then found guilty of colluding against the players on three separate occasions and were fined as punishment. Owners were gambling that the fines would be less than paying free agent salaries in unrestrained bidding. They claimed that the players' financial contributions did not match their salaries, which was tested later in this study.

Baade and Tuttle (1991) used Scully's technique for measuring MRP to estimate the marginal revenue product for the players. It was a two-equation model defining the relationship between team and individual player performance and team revenues and team performances. There had been theoretical support that free agency caused overbidding and inflated salaries. Baade and Tuttle attributed the collusion by the owners as proof of this theory being valid.

Scully's model was modified in Baade and Tuttle's (1991) study. The modifications were on player performance and a player's effect on attendance when in and out of the lineup. Team standings are looked at as being more important than winning percentage. Theoretically, a player could have contributed to attendance beyond this, but it was considered rare. A two-stage production process was visualized whereby players were combined with coaches to produce an intermediate output, team quality. This is

primarily how individual players influenced attendance and revenues. Regressions were run using five players looking only for the effect of being in and out of the lineup. First, the F-values were found to be significant ($p<.01$). Second, in four of the five cases, the everyday player showed no significant effect on attendance other than their impact on team performance. It was also suggested that a new everyday player might boost pre-season interest based on anticipation of performance but had no effect on day-to-day attendance.

Baade and Tuttle's (1991) version of MRP required four separate calculations. The first was computing team revenues for clubs that the everyday players represented. Second, statistically determining the relationship between attendance and team standings. Cities were placed in segments according to population to insure a sample size sufficiently large to justify conclusions. Information from independent player regression was significant ($p < .01$). Also, all the standings' coefficients exhibited the correct sign (as the number of games a team is out of first place increases, attendance decreases), and all coefficients were significant ($p < .01$). Third, it was found the different sizes of cities exhibited different dispositions toward winning. Fans in large cities were more responsive to winning than fans in smaller cities. The third calculation was of team standings and attendance for the season if the everyday player had played the entire season. The fourth was that an average salary for a starting player on each team needed to be determined. Two separate equations, one for the everyday player and one for the pitcher, were used. The findings were that players accounted for at least 40% of attendance and revenues assuming all attendance associated with the variables was

attributable to the team's management, which was likely to underestimate the players contribution.

In summary, the control over player salaries has resulted in many legal struggles. Owners had tried to restore financial integrity by balking at free agent signings, then the players responded by suing the owners for collusion in violation of the Basic Agreement. Baade and Tuttle (1991) identified, however, a number of instances where players were being overpaid. More analysis needed to be conducted to determine the incidence of overpayment or underpayment. Of the fourteen players analyzed, four were overpaid, three were paid approximately their worth, and seven were underpaid. Finally, this analysis was focused on a single year, and would be more fair to players and owners to analyze the salary-MRP ratio over the lifetime of a contract.

Free agency and arbitration have had the most profound effect on the economics of baseball since its inception. Hadley and Gusttafson (1991) analyzed this effect on player salaries. Also examined were performance related issues and their effects on salaries. Regression analysis was used to determine this effect on salaries. Separate equations were used for pitchers and hitters with salary being determined by different performance and team characteristic variables. The league in which the player competed was also a factor because of the league's differences, i.e., the designated hitter, managing styles, and officiating.

Hadley and Gustafson's (1991) equations also identified players eligible for arbitration and free agency with binary variables. Long-term contracts were identified using two different binary variables concerning whether there were two or three years

remaining on their contract at the beginning of the 1989 season. Top hitters and pitchers were also designated as variables for the equations. The hitters' equation used data from 394 players with 100 or more at-bats and the pitchers' on 247 pitchers with at least 50 innings pitched. This data was gathered from the Associated Press Wire Service, the Baseball Encyclopedia Update, the American League Red Book, and the National League Green Book.

Regression coefficients for both salary equations were estimated by ordinary least squares. The most important being years of major league service and its square, the market structure variables, and the baseball performance variables. Hadley and Gustafson (1991) then applied the Chow test to determine the regression results which indicated the equations were stable and significant ($p < .05$) for both hitters and pitchers.

Salary increases were found to be greater after salary arbitration than for free agency. The salary explosion in major league baseball began as the direct result of the free agent revolution and the partial demise of the reserve clause that it entailed. Collusion temporarily slowed this down but free agent bidding seemed to fully recover. Hadley and Gustafson (1991) speculated that this could have affected the results of this study.

The analysis indicated that salaries that were too large were awarded through arbitration. Hadley and Gustafson (1991) suggested that arbitration should be eliminated and all players with three years of service should be eligible for free agency with the player's current team having right of last refusal.

The predicted salaries were compared with actual players' salaries by computing the gaps between the actual and predicted salaries. Hadley and Gustafson (1991) then indicated that some players were overpaid compared with their predicted salary. It was then stated that application of the equations to individual players should be done with good judgment for exceptional circumstances.

Hadley and Gustafson (1991), in conclusion, demonstrated that baseball salaries were greatly influenced by the collective bargaining process. A larger impact from arbitration eligibility was shown over free agency. Players had reversed the earlier advantage of owners, and through arbitration, had been able to gain above-market salaries. It is to be noted that the main purpose of this study was to eliminate arbitration from the salary process.

A psychological approach was also used to evaluate this process and its effect. This was demonstrated by Bretz and Thomas' (1992) look at perceived equity, motivation, and arbitration in baseball. Free agency and salary arbitration were related to the equity theory in that once it was established, players' performance increased in the option year and decreased after signing with the new team. The research was conducted in the off season so it would not have effect on performance.

Bretz and Thomas (1992) presented five hypotheses. Hypothesis 1: Player performance increases in the season preceding arbitration. Because of arbitration occurring in the off-season, recent performance was likely to be looked at as instrumental. Hypothesis 2: Postarbitration performance regresses toward the player's average lifetime performance. Arbitration losers had been shown to demonstrate an increased decline in

performance than winners. Representing the magnitude of perceived inequity could have been the demand-offer differential. Hypothesis 3: The decrement of postarbitration performance is proportional to the demand-offer differential. Hypothesis 4: Players who lose arbitration are more likely to change teams than players who win. Hypothesis 5: Players who lose arbitration are more likely to leave baseball than players who win.

Bretz and Thomas' (1992) sample consisted of 116 arbitration cases settled between 1974 and 1987 and included all position players who went through arbitration during that period, except the sixteen cases arbitrated in 1975 and the nine in 1978. The arbitration cases were won 44% of the time by the players.

Salary demands, club offers, and arbitration outcomes were obtained from MLBPA, from Scully (1989), The Sporting News, and USA Today. Bretz and Thomas' (1992) measurement model was estimated using confirmatory factor analysis in LISREL VI. The LISREL maximum likelihood estimates were used as weights to create an index of baseball performance. This index was used as the dependent variable in the analysis. Average career performance was an indicator of general ability. Player movement was factored in for free agency, trades, and retirement.

Bretz and Thomas (1992) found no significant differences between winners and losers on experience, free agency eligibility, demand-offer differential, or salary level. A significant within-subject effect was noted on the repeated performance measure. Performance increased more for winners than it did for losers. Player experience had no effect, with losers having higher lifetime performance levels than did winners. However, winners had higher levels of recent performance and tended to remain at higher

performance levels than losers. Losing arbitration had detrimental effect, but demand-offer differential did not affect postarbitration performance. Player movement was explained essentially by player performance and age. Younger players and better performers were less likely to change teams.

Zimbalist (1992) examined free agency from a different view with its effect on competitive balance. He stated, "By any measure, competitive balance has not only not become more unequal since 1976, it has become noticeably more equal". This can be backed by the comparisons of dynasties pre-1976 to post-1976. In the period of 1949 to 1964, the Yankees appeared in twelve World Series and won nine of them. Since 1976, the only team to win consecutive World Series has been the Yankees. It is pointed out that the amateur draft began in 1965, but the leveling effect of this could not have been strong enough to have created the reversal of dynastic patterns demonstrated.

Another possibility of more competitive balance has been the poor job of signing top-performing free agents or of paying a player according to his output. This can be demonstrated by the relation of average team salary to team performance. In the years 1984 to 1989, average team salary demonstrated less than 10 percent of the variance in team win percentage ($r = .303$) and less than 12 percent of the variance in team standing ($r = .334$). This evidence demonstrates that it has not been possible to buy a winning team. Suggested as possible reasons for this were the variable effects of long-term contracts on player performance, emotional impact of performance of the increasing media and fan presence, the chemistry from mixing egos of high-priced free agents, and quality of ownership.

According to Zimbalist the compression of baseball talent was the most powerful force. In comparison of the U. S. population to those who play professional baseball, 35 percent less played in 1990 than in 1903. The population has become increasingly fit athletically, blacks and Latin players allowed into the game, and more extensive training programs for youths. This has caused the difference between the best, worst, and average players to be much smaller in the present day game, therefore leading to greater competitive balance among the teams.

A study by Kahn (1993) used longitudinal data for players to estimate the impact on compensation and contract duration of being eligible for free agency or for salary arbitration. Because eligibility is based on experience, the better players were likely to be kept longer. A fixed effects approach was used in this study.

Kahn's (1993) longitudinal data included salary data, contract information, player performance data, and local market data which was collected for roughly all major league players for the years 1987-1990. In addition, the sample of long-term contracts was extended back to the 1983-1986 period, with some contracts going as far back as 1979.

The fixed effects approach was used by Kahn (1993) with salary being affected by the variables of player eligibility for arbitration and free agency and performance and market variables. This was conducted within group and between group. A 1981 Hausman and Taylor test was implemented for equality of the two estimates. To actually specify player performance, an equation with variables of statistics was used. There were two separate equations for pitchers and position players.

Kahn's (1993) results on salary and contract duration were highest for free agents and for those in the year prior to free agency eligibility. Log annual compensation (LSAL) results suggested that eligibility for free agency did not have an incremental effect on annual salaries, but did benefit contract duration and total compensation.

Kahn (1993) concluded that arbitration and free agency eligibility had similar salary effects, but free agency raised contract duration, while arbitration had no effect on duration. There is a positive duration effect only when a team faced the loss of a player to free agency. The long-term contract postponed the need to participate in the free agent market.

An alternate to the then current estimates of pay equity could have been data envelopment analysis which exhibited promise for generating objective estimates of pay equity. Howard and Miller (1993) demonstrated its potential in baseball. The data envelopment analysis model was formulated as a fractional linear program. On a graph, players' ratios and extreme ratios were the edge, or efficient frontier, of the graph. Anything below it was not efficient; above it was over-efficient. This translated to baseball in under and overpaid salaries. Adding observations to an analysis set would have increased the possibility of redefining the efficient frontier. In relation to what regression analysis does not do, it provided a summary judgment on optimal efficiency and clearly identified the referents responsible for describing efficiency and quantified their influence.

Howard and Miller (1993) conducted this analysis on 433 major league pitchers were excluded because of different criteria, as were rookies for their non prior

performance records. Performance records were found in the Baseball Register and salary data from preseason newspaper reports. Players were coded by position, with the three outfield spots combined.

The linear programming module of SAS-OR was used to conduct four analyses. One analysis each for underpayment and overpayment for players by position and all players as a whole was used by Howard and Miller (1993).

The results of analysis by position consistently produced a smaller proportion of underpaid players than did overall analysis, because the former groups were smaller. Among Howard and Miller's (1993) position analyses, chi-square tests indicated that the outfielder analysis set included a significantly larger number of underpaid players ($x2=33.7$, $p<.001$). This was affected by there being more outfielders than players at other positions. Position players who were inequitably paid were the same in the overall analysis.

Howard and Miller (1993) observed that player perception of pay equity and objective estimates of pay equity were in correspondence. Of fifteen players who went to arbitration, seven lost. Six out of those seven were objectively undercompensated. The eight who won were found to have equitable or better salaries.

Howard and Miller's (1993) output clearly identified individuals who had an objective basis for perceiving underpayment inequity. The objective estimate of overpayment also had practical implications. Although some information was provided by data envelopment analysis that regression techniques could not, it was best considered a complementary and supplementary approach. Lack of data could have affected output

but should not have been a problem in organizational settings. Other problems, such as sample sizes and the number of variables analyzed, could affect results. Overall it provides useful information for decisions on format and levels of compensation as well as the ability to make adjustments.

Chapter III

Procedures

Collection of Data

The data collected for calculating dominance and the home and away attendance equations was acquired from four main sources. These sources were Hodges Library at the University of Tennessee, the National Baseball Hall of Fame and Museum, Inc., The Sporting News, and Douglas Pappas of the Society for American Baseball Research.

Data Analysis

The home and away attendance equations utilized multiple regression analysis and Pearson product moment correlation. Dominance was based over a ten year period of teams who had won at least two pennants.

Chapter IV

Results

The results of the regression estimates of both the home and away attendance equations demonstrated some significant results. They are examined and discussed in the first two sections of this chapter. Dominance numbers are then observed and the differences are noted. Tables are included for reference and comparison. The economic effects resulting from free agency are examined in the discussion.

Home Attendance

The regression estimates of both the home and away attendance equations demonstrated are from Hunt and Lewis' study (1969-73) and the current study (1990-93). First, the HATT (home attendance) equation conducted for this study yielded the following results: HATT = 2,415,218 + 10,895 (LEAD) (POP) + 65,137 (POP) -18,029 (WGBL) + 67.0506 (WGBL) (POP) - 1433 (WGBL-1) (POP)-10,957 (STAR) (POP) + 39,601 (FLAG) (POP) (aZ was not able to be calculated in the present equation). The multiple regression analysis for the current study demonstrated R square to be equal to .39, Degrees of freedom equal to 96, and F equal to 8.72. The equation in Hunt and Lewis' (1976) study demonstrated: HATT= 1,047,831 - .0063 (LEAD) (POP) + .3345 (POP) - 10,734 (WGBL) - .0019 (WGBL) (POP) - .0018 (WGBL-1) (POP) + .045 (STAR) (POP) + .0332 (FLAG) (POP) + aZ. The regression demonstrated R square to be equal to .74, Degrees of freedom equal to 111, F equal to 19.23.

Table 1. Home attendance regression variables

	LEAD POP	POP	WGBL	WGBL POP	WGBL-1 POP	STAR POP	FLAG POP
Hunt and Lewis	-.0063	+.3345	-10,734	-.0019	-.0018	+.045	+.0332
Present Study	+10895	+65,137	-18,029	+67.0506	-1433	-10,957	+39,601

There were some significant differences found between the equations (Table 1). The increase in the variables numerical value are attributed to an increase in population and therefore attendance. First, the R square for Hunt and Lewis' equation was .74 compared to .39 in the current study (Table 1). A majority of this is assumed to be accounted for by the omission of the vector aZ. Support for this is demonstrated by both away attendance equations demonstrating virtually identical numbers for R square. However, there were sign differences in the variables between the equations (Table 1). The first variable difference, lead times population (LEADPOP), was negative in Hunt and Lewis' study compared to positive in the current study. A possible explanation for this difference is that along with increased population, fans have become more apt to attend the games of winning teams in the post-reserve clause era. The next difference was between the weighted games behind the leader times population (WGBLPOP) variable. This is another variable which was positive in this study compared to negative in Hunt and Lewis'. A possible explanation could again be that the increase in population has had a positive influence on attendance and fans attend whether a team wins or loses. However, there seems to be a limit to this. As was demonstrated in both studies,

weighted games behind the leader lagged one season times population (WGBL-1POP) was demonstrated to have a negative effect on attendance in both equations. The last difference can not be easily explained. Star times population (STARPOP) was found to have a positive effect on home attendance in Hunt and Lewis' study compared to a negative effect in the current study. A possible explanation could be that fans have grown apathetic to star players due to their exorbitant salaries.

The six variables were examined to determine significance and correlation with home attendance for the current study only. Of these six, five were found to be significant, with three being positively and two negatively. FLAG, LEAD, and STAR were positively correlated WGBL and WGBL-1 were negatively related.

Away Attendance

The AATT (away attendance) equation was calculated in similar fashion. This study's equation was as follows: AATT= 2,963,685 + 7396 (LEAD) (APOP) - 231,853 (APOP) + 33.258 (WGBL) (APOP) + 1.0010 (WGBL-1) (APOP) + 30865 (STAR) (APOP) + 18430 (FLAG) (APOP). The regression demonstrated R square to be .40, Degrees of freedom equal to 97, and F= 10.86. The equation in Hunt and Lewis' (1976) AATT equation demonstrated: AATT= 1,082,702 - .0028 (LEAD) (APOP) + .0881 (APOP) - .0022 (WGBL) (APOP) - .0018 (WGBL-1) (APOP) + .0082 (STAR) (APOP) + .0028 (FLAG) (APOP). The regression estimates were R square being equal to .39 and Degrees of freedom equal to 111. No F statistic was given in the Hunt and Lewis (1976) study.

Table 2. Away attendance regression variables

	LEAD APOP	APOP	WGBL APOP	WGBL-1 APOP	STAR APOP	FLAG APOP
Hunt and Lewis	-.0028	+.0881	-.0022	-.0018	+.0082	+.0028
Present Study	+7396	-231,853	+33.258	+1.0010	+30865	+18430

Although the R square of both away attendance equations was virtually the same for the away attendance equations of both studies, four out of six variables demonstrated differences in sign and value (Table 2). First, lead times away population (LEADAPOP) was negative in Hunt and Lewis'(1976) study compared to positive in this study. In examining this change, it would appear that as in the corresponding variable in home attendance, fans are more likely to attend games even if the visiting team is the division leader. It is speculated that the more a team is successful, the more their popularity extends over geographic areas. The next differences were demonstrated in the positive effect away population had on away attendance in Hunt and Lewis' study but a negative effect in the current study (Table 2). These are differences that cannot be logically explained. They were found in the variables of weighted games behind leader times away population (WGBLAPOP) and weighted games behind leader lagged one season times away population (WGBL-1APOP). These were both found to positively affect away attendance in the current study whereas they negatively affected it in the previous study. Both of these variables are opposite of the LEADAPOP variable but have the same positive sign. This does not seem logical and a valid correlation cannot be drawn.

Of the six independent variables in this equation three were found to be significant and correlate with away attendance in the current study. STAR was found to be positively correlated whereas APOP and WGBL were negatively related.

Dominance

The area of dominance was also examined over the period 1988-93 for this study and compared to the 1969-74 period in Hunt and Lewis' for teams who have won at least two pennants (Table 3). This was based on six observations for this study and eleven observations from theirs. The average level of domination in 1969-74 over the observations was .36 compared to .24 over 1988-93. A decrease of .12 was demonstrated in the post-reserve clause era.

Table 3. Average dominance (teams that won at least two pennants from 1988-1993)

	1988	**1989**	**1990**	**1991**	**1992**	**1993**	**Average**
Atlanta	.10	.10	.10	.20	.20	.30	.17
Oakland	.10	.20	.30	.30	.40	.40	.28
Toronto	.10	.20	.20	.30	.40	.50	.28
Average	.10	.17	.20	.27	.33	.40	.24

Chapter V

Discussion

One of the key variables to baseball revenue is the revenue from gate receipts. Recognizing this, home and away attendance can be a factor in a team's revenue and therefore in turn affects the economics of the game. A factor which was not included in the equations is that of the presence of the ever expanding media. With attendance approaching double that of 20 years ago, the media has not seemed to have had a detrimental effect on attendance. If anything, the exposure of players through the media has aided in raising interest to attract fans to the ballparks.

The post-reserve clause era has demonstrated a decrease in dominance as shown in the results. This is opposite of what baseball executives, fans, and the press speculated in the reserve clause era. Their speculation was that the elimination of the reserve clause would cause domination by the large city teams. With domination decreased by .12 as demonstrated in this study, it is obvious that this has not become the case. As Zimbalist (1992) discussed in the review of literature other evidence proves that it has not been possible to buy a winning team in the post-reserve clause era. In the years 1984 to 1989, average team salary demonstrated less than 10 percent of the variance in team win percentage and less than 12 percent of the variance in team standing.

However, free agency has catapulted salaries much over the effects of inflation and forced owners to find different avenues to increase revenues. Media revenue, because of local markets, has made the big market teams richer and widened the gap between them and the smaller market teams. According to Financial World (1996)

estimates, the smaller market teams average around $12 million in media revenues compared to $22 million (this is leaving the New York teams out which combined for an unbelievable $88 million in 1996) for the bigger markets. Relatively, this does not seem to be a lot, but this has a domino effect beginning with the ability to sign quality free agents. This in turn aids a team in achieving more success and therefore an increase in gate receipts and total revenue. Teams such as Montreal and Pittsburgh are not able to compete for free agents and must gamble that a group of home grown players and young players acquired in trades can be competitive in time before they achieve free agent status to produce a winning team. Revenue sharing has long been espoused as the answer to this and was recently implemented in the new agreement at the time of this study.

The true effect on free agency on dominance will probably never be gauged due to continuing expansion of MLB. This has most certainly thinned the talent and leveled a majority of the playing field. A good example of this is how quickly the latest expansion teams have become competitive. Only one team, the Florida Marlins have failed to make the playoffs and are a favorite for a wild card playoff spot in 1997. The only team to acquire a significant level of dominance in recent years has been the Atlanta Braves (a portion of this dominance extends beyond the scope of the study). Their level of dominance can be correlated to the hiring of quality personnel which began with the hiring of John Schuerholz as general manager. A majority of their talent has been accrued through an excellent minor league system which has produced quality players for the major league club or for trades to acquire other players. Quality of ownership can certainly be a factor, however, applying a variable to this would certainly be difficult.

This is the major disparity that is currently present in MLB. Even though dominance overall has decreased and no one team has dominated in this era, there is still a great disparity between the big and small market teams. The teams that play in big markets have a competitive advantage over other teams and the very small market teams have found it almost impossible to be competitive. For example, even though the Braves have developed most of their own talent, when they become free agents they have been able to sign them and often other free agents that were needed. This has developed through the Braves being in a larger market than other teams and having the excess revenue as a result. With salaries approaching the revenue now being generated, teams have looked at other ways of generating revenue by building new facilities to boost attendance or selling luxury boxes.

The studies reviewed have varied on the arbitration process and its effect. This, along with free agent eligibility status, has definitely had a detrimental effect on baseball and labor-management negotiations with four work stoppages since their inception. Owners have tried to compensate for the spiraling salaries by generating new sources of revenue and even collusion. This is only delaying the inevitable with a finite number of revenue streams available to them. The process of free agency and salary arbitration must be re-evaluated and changed to bring things under control. It can also be seen that as long as teams can still have satisfactory attendance while increasing ticket prices above the effect of inflation, they will have an endless stream of increasing revenue. This, however, will probably not be able to maintain pace with the current increases in salary

The players view should also be examined in this area. They have insisted all along that the owners are making far more than is known. The MLBPA has demanded that the owners who are losing money should open up their books to them. If teams are truly losing money and it is not just creative accounting making it seem this way, players may be more sympathetic to changes in free agency and salary arbitration in future negotiations.

Chapter VI

Summary

In the period after the elimination of the reserve clause the variables which affect attendance were observed to have demonstrated a shift from the reserve clause era. Individually, some of these variables have demonstrated a different effect in the post-reserve clause era. However, with the combination of these variables, it is observed their overall impact on attendance has stayed relatively the same. Attendance has continued to increase at a healthy rate during this period.

Dominance has decreased compared to the reserve clause era. Even though this is the case, there is still a problem with a few of the teams in the smaller markets who have found it hard to compete in recent years. Free agency and salary arbitration have caused much controversy and been at the heart of labor disagreements.

Conclusions

a) It has been demonstrated by this study that the factors affecting home and away attendance have changed in the free agency era. This has obviously not had a detrimental effect, but should be observed to understand what is affecting present attendance figures. b) As anticipated by Hunt and Lewis' study, the current perfect recontracting players market has produced a level of dominance over the long run corresponding to the recontracting market at the time of their study. The academic and popular press of their time believed that the big city teams would dominate and ruin competition, when in fact, competition has become more balanced. c) The main effect that the elimination of the

reserve clause has had on the economics of baseball has been the impact on inflation of salaries due to free agency and salary arbitration.

Implications

The changes in attendance factors are interesting and some have the opposite effect than what would be expected. These should be utilized to better understand what affects attendance and why the teams in the smaller markets have struggled. Even though dominance was demonstrated to have decreased, a disparity does exist and a two tier structure of teams has materialized. This should be addressed and a plan implemented to aid these teams in being more competitive. Also, the studies in the review of literature on free agency and salary arbitration revealed, over a period of time, that these processes had lost their original focus, particularly arbitration, and should be examined in order to implement changes.

Significance of the Study

The results of this study demonstrated the impact of the elimination of the reserve clause on Major League Baseball. It examined if the level of dominance had been affected by free agency and salary arbitration. The results could point to problem areas that need to be addressed to improve competition. These areas could be examined and used to aid in future collective bargaining sessions between the players and owners to maintain a competitive balance and the economic viability of all teams.

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