

**The Effects of Free Agency on Wage Efficiency and Talent Distribution in Major League
Baseball**

By

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Abstract

The strikedown of the Reserve Clause in Major League Baseball, also referred to as the institution of free agency, has reconfigured the baseball player labor market. Player wages have since skyrocketed, indicating changes in wage efficiency and talent distribution. This paper attempts to locate and understand any such changes as a direct result of free agents entering the Major League Baseball labor market. Wage efficiency is discussed by group (non-free agents and free agents) and is studied both before and after the implementation of free agency. It is determined by comparing actual wages to marginal revenue products of labor using team win percentage as the firm output. Non-free agents are found to be underpaid relative to their value, and free agents are generally found to be overpaid. These results imply a complex bilateral monopoly labor market where team monopsony power is strongest against non-free agents and monopolistic free agents successfully push wages upwards. Changes in talent distribution are studied by comparing trades under the Reserve Clause to free agent migration trends. Free agents tend to relocate to large market teams; however, acquiring free agents does not greatly increase team winning percentage. This indicates that League competitiveness is not significantly harmed by free agency. Research suggests a restructuring of free agency eligibility criteria such that players become free agents sooner in their careers would mitigate inefficient outcomes by increasing labor supply and reducing player monopoly power.

Introduction

Professional athletes are often associated with luxurious lifestyles and wealth. It is no secret that many Major League athletes enjoy multimillion dollar salaries as regularly headlined in sports journals. Some notable contracts include Shohei Ohtani's famous \$700 million contract with the LA Dodgers or Rougned Odor's \$50 million contract with the Texas Rangers, which

included two horses to appease his horseback riding hobby during the off-season (Clair and Garro 2017).

Although these sensationalized headlines may be common today, for many decades baseball salaries were meager in comparison. This is because Major League Baseball (MLB) was able to successfully evade a competitive labor market for much of its history. Baseball players were not able to achieve free agency until the 1970's. Prior to its institution, the Reserve Clause was in full effect, and athletes were drastically underpaid from the perspective of classical economic labor market theory.

The introduction of free agency to the MLB labor market enacted considerable change. Under free agency, teams undergo bidding wars for the most coveted players, and talent distributes itself among the League. This transformation in market dynamics makes an interesting case study for economists, as the MLB serves as a tangible economic model in which labor market theory and Coase Theorem can be observed (or not observed) in real time. This paper aims to study two primary components of the MLB labor market before and after free agency via literature review; (i) wage efficiency and (ii) talent distribution.

The first objective is accomplished by defining baseball's production function. The production function utilizes player statistics and other independent variables as inputs to produce a dependent output, team wins. Then, researchers must find players' marginal contributions to team output by calculating the marginal revenue product of labor (MRP) of each player.

Efficiency is realized when a player's MRP is equal to his wage and thus, is compensated in congruence with his contribution to team performance. The research articles reviewed in this paper estimate player MRPs from various seasons and assign values to players. Then, values are found to either correlate with nominal salaries or deviate. This paper summarizes researchers'

conclusions and describes free agency's part in generating an efficient or inefficient labor market.

The second objective of this paper is studied by observing talent distribution across the League, specifically between small market and large market teams. This is important to all baseball stakeholders - fans and team owners alike - because it concerns competitive balance. Competitive balance protects demand for baseball entertainment and the opportunity for teams to achieve glory with the title of World Series Champion. This paper revisits the fear that under free agency, large market teams have an upperhand in obtaining talent, effectively degrading competitive balance and the spirit of baseball.

The study of both wage efficiency and talent distribution are critical in understanding the baseball labor market and how it has evolved over time. America's pastime is certainly a fascinating topic for economists, as it serves not only as a massive revenue generator and economic giant, but also as a confined model in which economic theory can be observed. The extensive rules and regulations that exist in the nearly two hundred page MLB rulebook enable various market forces to interact, resulting in an entirely unique labor market.

Section 1: Relevant History

Baseball is somewhat of an anomaly from the perspective of an economist. Its uniqueness can be attributed to its many encounters with the Supreme Court. For many years, the League manipulated the player labor market with the Reserve Clause, which gave it monopsonistic buyer power. The Reserve Clause stated that the rights of player services were reserved entirely for the owners of teams.

This meant that during trading periods, team owners would negotiate with each other to distribute baseball talent among the League. Players had virtually no influence on these

decisions. A club could reassign or trade a player's services at their discretion. Each player was presented with a contract and had essentially two options: to accept or sit out the season.

Superstar players had minimal bargaining power, yet they were still largely undercompensated.

Although shockingly inefficient and predatory, this monopsonistic behavior was permitted. The first case involving the Reserve Clause reached the Supreme Court in 1922. The resulting decision allowed baseball Leagues to be exempt from the Sherman Antitrust Act because the Court found that baseball exhibitions were not considered interstate commerce (U.S. Supreme Court 1922). From this moment on, professional baseball was immune to Commerce Clause legislation, despite two subsequent challenges in the Supreme Court in 1953 and 1972.

In professional sports today, it is difficult to imagine a Yankee player working a second job. Yet, during the earliest years of baseball, many athletes were forced to find additional income. Jim Palmer, a 1966 World Series champion, sold suits during the off-season. Christy Mathewson was an All-Star player and gas pump attendant (Kantor 2022). This illustrates the disparity between player wages under the Reserve Clause and the era of free agency.

As players grew frustrated with the unfairness of their wages, they began to unionize. The first player union in the MLB was established in 1885, called the Brotherhood of Professional Base-Ball Players (MLB Players, n.d.). Eventually, today's Major League Baseball Players Association (MLBPA) was formed under the leadership of economist Marvin Miller (MLB Players, n.d.). Miller had experience in counseling successful labor unions, and his impact on professional baseball cannot be overstated.

Under the Reserve Clause, player strikes were common, sometimes halting the season entirely. The League and MLBPA facilitated multiple collective bargaining agreements over time, slowly raising wages and eventually agreeing on the addition of salary arbitration. In 1970

under Miller's command, the MLBPA won the right to binding salary arbitration, which meant players could bring their salary disgruntlements to a third party decision maker (MLB Players, n.d.).

Salary arbitration was a major step towards the establishment of free agency and the evolution of player contracts from the thousands to the millions. In fact, the right to free agency was won through an arbitration dispute only a few years after the first cases were underway. After some deliberation, it was agreed that players would own the rights to their services after six years of playing in the MLB (MLB, n.d.). Players can negotiate directly with teams and choose where they migrate, granting them more bargaining power than ever before (MLB, n.d.).

Section 2: Economic Theory

Understanding the Reserve Clause and free agency are both important in connecting economic theory to the unique MLB labor market. In order to determine how each has affected the efficiency of player salaries and talent distribution, it is first important to understand the basic tenets of a classical labor market theory.

2.1 The Production Function

Every firm's operation concerns two components: inputs and outputs. A production function links these together and mathematically explains how a quantity and combination of inputs produces a predicted quantity of outputs. A baseball firm is often defined as either an individual team franchise or the League as a whole. In either definition, a baseball firm has inputs and outputs just as any other business. A simplified production function goes as follows:

$$(1) f(\textit{Labor}, \textit{Capital}, \textit{Land}) = \textit{Output}$$

In this paper, a baseball firm will be defined as an individual franchise, team or club.

Inputs are commonly divided into three categories: Labor, Capital, and Land. In baseball, capital inputs include equipment, ballparks, and uniforms; land inputs include playing fields and training space; and labor inputs include players, medical staff, coaches, concession workers, and so on. Although baseball firm inputs are easily definable, output is a topic of debate for economists. Defining output is an essential component of this paper because player values are derived from how much output they help produce. Changing the baseball firm output definition may change player values.

Some take the position that output is simply team wins or winning percentage. By this definition, a baseball firm's production function may look like this:

$$(2) f(\textit{batting average, home runs, stolen bases, earned run average, errors, manager's lifetime winning percentage, etc.}) = \textit{Winning Percentage}$$

Others define the output of a baseball team as entertainment or excitement for fans, in which case more inputs have influence and can be included in the production function i.e. concession workers, stadium design, rivalries. A production function for entertainment may look like this:

$$(3) f(\textit{rivalry, concession workers, stadium design, home runs, bases stolen, challenges, mascot race, ejections, close calls, etc.}) = \textit{Entertainment}$$

Although entertainment is a plausible definition, this paper defines output as team wins or winning percentage. This is appropriate given the definition of a baseball firm as an individual franchise as opposed to the broader League. Although the League might want to facilitate entertainment, each team is expected to target wins for a greater chance of reaching the World Series Championship.

In fact, the League's pursuit of entertainment is accomplished by teams competing with each other for victory. The design of the postseason revenue structure illustrates this. First, the

League has designed the World Series Championship such that there is a large discrepancy between first and second place titles. Therefore, there is a large financial incentive for teams to compete for the first place title. Second, all postseason teams benefit from a more favorable revenue cut that increases with closeness to the championship. Both of these frameworks allow teams to grow revenue by winning.

Additionally, when all clubs aim to produce wins, rivalries, close-call games, and upsets naturally result. The demand for baseball is a function of these entertaining outcomes, and revenue increases with higher gate attendance, viewership levels, and merchandise purchases. This explains how entertainment is derived from baseball firms producing wins as their output. Winning also generates fan involvement and support. Therefore, the production function used in much of the literature considered is similar to equation (2).

2.2 Supply and Demand in a Labor Market

In every market, there is a supply for a good or service and a demand for a good or service. In a labor market, labor is the service being demanded and supplied. The League or teams are the demanders, and players are the suppliers. The supply and demand curves represent this graphically.

The equilibrium is where supply meets demand and a prevailing price and quantity are determined. Every labor market differs according to the slope and positioning of the curves. In a labor market, price is the wage (W) a worker is paid for his services ($P = W$), and quantity is the quantity of labor units supplied (L).

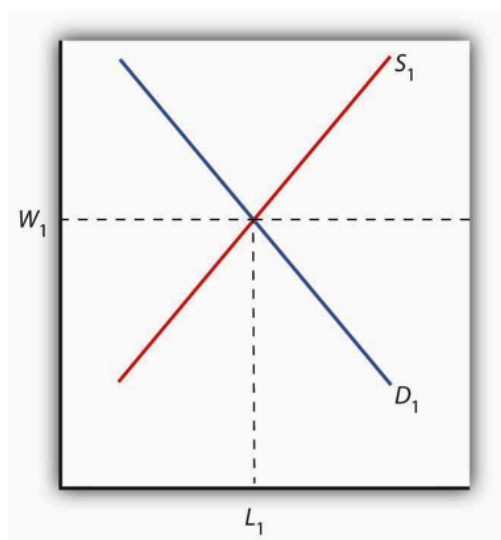


Figure 1. Labor market equilibrium.

Source: Lumen Learning. n.d. “Labor Markets at Work.” Microeconomics.

<https://courses.lumenlearning.com>.

There are multiple factors that can impact the curves resulting in shifts. For example, population, working conditions, employee benefits, and opportunities in other markets can shift the supply curve either right (increasing labor supply) or left (decreasing labor supply). As for demand, technological advancements, government policies, derived demand, and changes in the price of capital are shifters.

There are three ways a wage rate can increase, *ceteris paribus*; (i) a rightward demand curve shift, (ii) a leftward supply curve shift, or (iii) both. Alternatively, there are three ways a wage rate can decrease, *ceteris paribus*; (i) a leftward demand curve shift, (ii) a rightward supply curve shift, or (iii) both. The effects on equilibrium quantity will be the inverse. Any combination of labor supply and demand shifts will result in a new equilibrium and thus, a new prevailing wage (W) and quantity of labor (L).

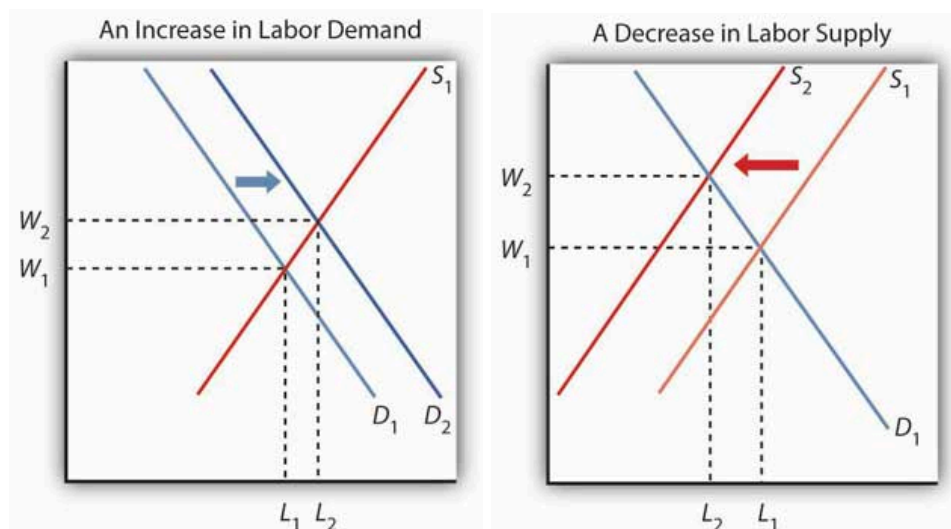


Figure 2. Shifts in labor demand and labor supply.

Source: Lumen Learning. n.d. "Labor Markets at Work." Microeconomics. <https://courses.lumenlearning.com>.

2.3 A Monopsony Labor Market

Baseball has many peculiarities as opposed to a perfectly free market. Today's baseball labor market is very different from the market that existed under the Reserve Clause. Before free agency, there was only one demander of player labor: the League. Although there were many teams, they acted as a single employer. Players were unable to shop around for other jobs, and were only traded between teams once employed by the MLB.

This absence of buyer competition created a monopsony market. A monopsony is defined as a market in which there are many sellers but only one buyer (the monopsonist). Under the Reserve Clause, the many sellers were the players, and the single buyer was the League. The monopsony market allowed the League - and the owners who comprised it - to forcibly push down player wages. From an efficiency standpoint, this is suboptimal, as the monopsonist can hold wages below player values.

2.4 A Bilateral Monopoly Market

The institution of free agency shifted the MLB labor market from a monopsony to a bilateral monopoly, which contains a monopolistic seller and a monopsonistic buyer. A monopoly is defined as a market with one seller. Depending on the context, the MLBPA or an individual player can represent the single seller or the monopolist. Although the MLB still has monopsonistic power as the only Major League, it is diminished by free agents' ability to migrate between teams and intraLeague competition for players.

Monopoly power is often derived from scarcity. High performing athletes are a scarce resource and become even scarcer when teams shop at the position level. Player bargaining power has increased dramatically after free agency because players now get to take advantage of their scarcity. Teams struggle to collude and are forced to compete in bidding wars over free agents. A bilateral monopoly is characterized by these two powerful forces competing with one another. The monopsonist will try to push wages lower, and the monopolist will try to push wages higher. The supply and demand curves of each trading period represent the ebb and flow of power between the two parties.

2.5 Marginal Revenue Product of Labor

A highly critical concept in labor market economics is marginal revenue product of labor (MRP). MRP is defined as the change in the value of total output by the addition of one more unit of labor. It is essentially a measure of productivity.

A wage (W) is considered economically efficient if it is equal to the marginal revenue product of labor (MRP) of the employee. In other words, the worker should be paid equal to the marginal benefit he brings or contributes. This concept yields the efficiency rule: $W = MRP$.

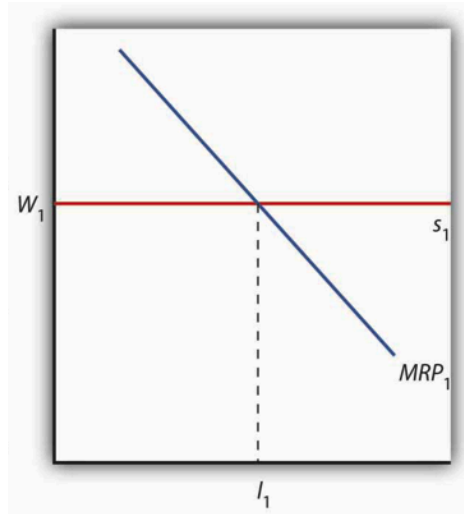


Figure 3. Labor efficiency.

Source: Source: Lumen Learning. n.d. “Labor Markets at Work.” Microeconomics.

<https://courses.lumenlearning.com>.

MRP is related to both a firm’s revenue function and production function. In MRP, marginal revenue (MR) refers to the value of the additional units produced, and product (P) refers to the output of the production function. Therefore, MRP increases in two ways; *ceteris paribus*, (i) the value of the output increases (derived demand) or (ii) the worker becomes more productive. The first generates additional revenue holding units produced constant, and the second produces more units of output with no additional effort expended.

Marginal revenue product of labor is the crux of understanding wage efficiency. Each player has a different MRP which takes into consideration his talent, position, and team. This presents a challenge to clubs, as they must undergo complex valuations when shopping for talent. Economists are able to perform these calculations and justify or discredit teams’ payroll decisions.

2.6 Coase Theorem

The Coase Theorem is an important concept in understanding talent distribution outcomes before and after free agency's institution. Coase Theorem says, *ceteris paribus*, the change of property rights from one party to another will not change the concluding distribution (or the efficiency thereof). Therefore, under Coase Theorem, allowing players to own the rights to their services (as in the case of free agency) should not significantly impact talent distribution, meaning there will be no change in where free agents sign as opposed to being traded.

There are four primary conditions to be met for Coase Theorem to hold: (i) the market must be competitive, (ii) there are no transaction costs, (iii) there is perfect information, and (iv) there is an efficient set of inputs and outputs (The Investopedia Team 2024). Therefore, if the Coase Theorem holds when looking at the MLB labor market, then it is likely that talent is distributed optimally among teams with or without free agency because players end up where they are needed most and therefore valued the highest in either scenario. In other words, distribution outcomes are the same if owners initiate player trades or players choose to migrate, as in the case of free agency.

Although the conditions above are generally required, it is also possible for the Coase Theorem to be applicable if they are somewhat relaxed or imperfect. However, a change in property rights must not affect the forces that cause any persisting inefficiencies in this type of market. Therefore, the Coase Theorem may still hold if equal levels of efficiency (or inefficiency) are achieved before and after the transfer of property rights as long as the inefficiencies are attributable to the same cause (for example, the presence of minor transaction costs). Ultimately, the aforementioned conditions are difficult to achieve, making Coase Theorem rarely observed in real-world markets. However, understanding why Coase Theorem may not hold true can be beneficial for economists in understanding underlying inefficiencies.

Section 3: Arbitration

Recall that before there was free agency, the MLBPA first won the right to salary arbitration. Salary arbitration was instituted in 1970, but the first hearings were not held until 1974 (Gilbert 2006). Although arbitration does not grant players as much bargaining power as free agency, it does provide them a channel to obtain equitable compensation with their peers and involve a superseding third party.

As defined in the MLB glossary, arbitration is available for “players who have three or more years of Major League service but less than six years . . . if they do not already have a contract for the next season” (MLB, n.d.). Owners argue that the first three years of service, also known as the reserve years, recover the costs of developing players in their farm teams. This is why a player must wait and provide services at initial contract terms before having the right to negotiate with his team.

An arbitration-eligible player can negotiate his salary, but with his team only. The process of arbitration occurs when a player and his team cannot come to an agreement before the mid-January deadline. If an agreement is not made, both the player and the team submit a proposal to an arbitrator, who then decides which party will prevail (Waterson 2023). This is called absolute arbitration, as one of the two proposed salaries is chosen but never a salary in between them. In fact, it is possible for a player’s salary to decrease relative to the year prior in the arbitration process; therefore, both parties have an incentive to settle independently before this deadline (MLB, n.d.).

Arbitrators consider many factors when making decisions including, “player performance during the past season, length and consistency of the player’s career, comparative salaries, and the team’s recent performance in the standings and at the gate” (Kahn 1993). Furthermore,

arbitrators are not permitted to take into consideration factors such as the transaction costs of arbitration, media and press comments, or the team's current financial position (Kahn 1993). This process is a channel through which players can achieve more equitable and possibly more efficient wages.

Section 4: Free Agency

In 1975, a controversial arbitration case finally broke the yoke of the Reserve Clause. Famous arbitrator, Peter Seitz, did what the Supreme Court would not; he established an avenue for players to resist monopsonistic exploitation (Abrams 2009). His decision had a domino effect, and by 1976, free agents began to flood the market. Because the hearing concerned the Reserve Clause, it was a highly controversial case. Owners were fierce in defending their rights to player services by publicly criticizing Seitz and the case. They claimed it was not arbitration eligible in an attempt to obstruct the proceedings, but they were unsuccessful, and baseball would never be the same.

The dispute concerned a provision in the Uniform Player's Contract, which gave owners the option to renew a player's contract "on the same terms" for "one year" (Abrams 2009). The case was to determine if the LA Dodgers had the right to renew star pitcher, John Messersmith's, previous contract after the two parties could not reach an agreement. Dave McNally, a recently retired athlete, chose to include his name in the proceedings as well in support of the effort because he faced a similar complication (The Spokesman Review 1975).

The Dodgers argued the provision gave them the automatic right to renew Messersmith's contract following the expiration of his previous one. However, the franchise had already utilized the option to renew his contract once before. Messersmith disagreed with the Dodger's interpretation of the provision, arguing the team had the right to renew only once. Marvin Miller

filed the grievance, and the union's legal representation, Dick Moss, argued on behalf of the MLBPA, Messersmith, and McNally. In the end, Seitz sided with the argument that "one year" translates legally as "once" (Abrams 2009).

Owners were furious and criticized the decision, claiming the competitive balance of baseball would be ruined. Many small market teams were fearful of losing critical players to larger, richer teams under free agency. Dick Moss publically refuted their claims that free agency would devastate the sport, saying, "the real fear of the club owners is that the players will finally be receiving closer to their full value" (The Spokesman Review 1975).

Free agency was officially established after a series of negotiations between the MLBPA and the League (Markusen, n.d.). The two entities agreed that free agency would require the following eligibility conditions; (i) the player's contract must be expired, and (ii) the player must have at least six years of service in the MLB or be voluntarily released from their organization (MLB, n.d.). Once a player is considered "free," he is no longer obligated to negotiate exclusively with his team. A free agent can sign a contract with any team as long as the two parties come to an agreement (MLB, n.d.).

In light of owners' concerns over competitive balance and free agency, the League later imposed a competitive balance tax on teams, often referred to as a soft salary cap or luxury tax. Unlike the National Football League (NFL), MLB teams can violate the League's cap on aggregate salary spending, but they must pay a tax as a penalty for doing so (MLB, n.d.). The NFL and National Hockey League (NHL) both impose hard salary caps. The idea behind either type of salary cap is to constrain team expenditures such that smaller teams can compete with larger teams (in terms of wealth) in an auction market for talent.

The MLB sets a salary expenditure limit every season, and those who surpass the limit are subject to taxation. The tax imposed on a team increases with severity of violation and with history of consecutive violations (MLB, n.d.). With these two factors in mind, a tax rate is determined for the violating team and is then applied to the average annual value of each player's contract on the 40-man roster (MLB, n.d.). Once all teams in violation of the luxury tax have paid their portion, the League distributes all of the collected capital among the teams within good standing of the cap. Essentially, the luxury tax is an economic tool used by the League in an attempt to facilitate competitive balance in light of owners' concerns over free agency and wealth disparities across teams. This is important to note when studying talent distribution and competitive balance in Section 6.

Section 5: Wage Efficiency

The introduction of free agency to the Major League Baseball labor market has made an indisputable impact on player wages. Once the Reserve Clause was struck down, there was a large shift in market power, which has allowed free agents to earn exponentially higher salaries. Even reserve year players have experienced some benefits from this reconfiguration, as the League minimum wage has been gradually dragged upwards by negotiations between the MLBPA and the League. Inflation alone is not enough to explain player salary growth. With free agency in place for nearly half a century, the first objective of this paper presents itself:

“How has free agency affected the efficiency of player wages?”

Recall that in order for a player's contract to be economically efficient, his compensation must be equal to the value of his individual contribution to a team. In economic terms, $W = MRP$. If clubs behave rationally according to economic theory, they should evaluate past

performance and factors that have the potential to affect future performance such as medical history and injury risk when undergoing player valuations.

There are multiple ways a player contract can be priced inefficiently. Some obvious answers as to why are simply that a team is unable to accurately measure a player's talent or a player unexpectedly suffers from a significant injury; however, economic theory explains why inefficiencies might persist consistently rather than sporadically. Intuitively, a player can be paid three ways:

- $W < MRP$
- $W = MRP$
- $W > MRP$

If wage is greater than marginal revenue product of labor, a player is overcompensated relative to his value, and if it is less, he is underpaid.

5.1 $W < MRP$

Suboptimal contracts due to undercompensation were more commonly observed before the institution of arbitration and free agency, which is expected in a monopsony market. One of the most influential economists to study this phenomenon is Gerald W. Scully. In his 1974 article, he finds persistent evidence of $W < MRP$ in the early seasons of baseball (Scully 1974). Since then, Scully's work has been referenced and modified by many subsequent studies.

One of such studies finds that from 1968 to 1969, players were paid an estimated 30% to 50% of their MRP values (Medoff 1976; Hill 1985). Despite being the crux of the team production function, players only received 16% of all MLB revenue from the 1970 to 1973 seasons (Scully 2004). This illustrates how significant underpayment was common prior to the first cohort of free agents in 1974 (Scully 2004).

The primary reason for underpricing today can be attributed to persistent League monopsony power, which encompasses mainly rookies who are in their reserve years (Scully 2004). The MLBPA regularly renegotiates the League minimum wage in an attempt to make salaries for these players more equitable. However, as previously mentioned, owners often argue that they require a certain return on their investment from player development. Ultimately, non-free agents suffer the greatest from this type of inefficiency (Scully 2004).

Scully (2004) proves this to be true by using a two equation model to estimate player MRPs in seasons ranging from 1970 to 1998. His first equation represents the relationship between player performance (using slugging average and $1/ERA$) and win percentage (Scully 2004). The second expresses the relationship between revenue and win percentage (Scully 2004). These equations together encompass the “marginal revenue” and “product” components of MRP.

Through this method, Scully (2004) observes a large inequality across all MLB player salaries, and claims that non-free agents are largely underpaid. Although the MLB salary minimum has risen over time, the benefits of market liberalization have been enjoyed almost exclusively by free agents (Scully 2004). Scully (2004) suggests that if all players were free agents, salary disparities would abate. However, under the current market structure, non-free agents are more likely to experience $W < MRP$ than free agents (Scully 2004).

It is important to note that although $W < MRP$ is not commonly observed in free agents, it is possible in certain scenarios. For example, long term contracts have a higher chance of yielding inefficiencies due to the uncertainty of future performance. Particularly, long term contracts can cause a player to be underpaid if he enters into an agreement before his peak performance years. Research suggests that a player is in his prime around ages 29 to 31 (Oswald 2016). When an athlete signs a long term contract valued on previous performance, his wages

may be discounted during his peak performance years. However, players may still sign this type of inefficient contract as a hedge against injury risk.

5.2 $W = MRP$

Some studies suggest near efficient wages for arbitration and free agent players including a 1994 study by MacDonald and Reynolds. These researchers run a regression analysis of individual salaries (with the exception of players within their first two years) on estimated MRPs from the 1986 and 1987 seasons (MacDonald and Reynolds 1994). They find that across all Major League players, salaries generally coincide with MRPs; although, they also find significant deviations (MacDonald and Reynolds 1994).

The observed outliers are likely attributable to the Superstar Effect, which is when a highly talented athlete's salary supersedes his MRP due to the novelty of his presence on a team. Research on the Superstar Effect is mixed because there are complexities that must be considered when valuing the revenue generating abilities of a player, which in turn affects his MRP. A superstar may increase revenue through ticket sales, merchandising, sponsorships, and increased viewership more than a non-superstar. By increasing derived demand for team victory, a player increases his MRP as well. Estimating a superstar's MRP is thus more complex and outside the scope of this paper.

It is important to note that MacDonald and Reynold's (1994) data includes all but first and second year players, not exclusively free agents. Therefore, their overall generalization may be slightly different than for free agents alone. Additionally, the MLBPA filed a grievance against clubs during the 1980's for collusion against free agents. Therefore, it is possible that such collusion may have distorted outcomes in this research.

MacDonald and Reynolds (1994) use a production function that is similar to equation (2) in Section 2.1, and it goes as follows

$$(4) WP = a_0 + bRUNS + cERA + dCONT + x4OUT + e$$

In simple terms, *WP* is win percentage, *RUNS* is team runs, *ERA* is team ERA, *CONT* and *OUT* are measures of closeness to being the division winner, and *e* is a classical white noise stochastic disturbance term (randomness) (MacDonald and Reynolds 1994). They pair this with an equation that expresses revenue as a function of winning percentage, local population, local personal income, the presence or absence of another baseball team in the area, and another white noise stochastic disturbance term (MacDonald and Reynolds 1994).

MacDonald and Reynolds (1994) make some interesting discoveries; the first being that player salaries comprised approximately 40% of gross MLB revenues for both years. This is a drastic increase from the 16% of revenue that was distributed among players just fifteen years prior (Scully 2004). Therefore, free agency has gradually redirected the share of MLB revenues to favor players more heavily than before. They also conclude that pitchers are slightly overpaid, whereas hitters are slightly underpaid according to their MRPs (MacDonald and Reynolds 1994). They explain this phenomenon by attributing pitcher overcompensation to their increased likelihood of injury while under contract (MacDonald and Reynolds 1994). This represents the opposite type of inefficiency associated with long term contracts. Ultimately, MacDonald and Reynolds (1994) hold the conclusion that athletes in their data set are priced relatively efficiently.

5.3 W > MRP

While MacDonald and Reynolds (1994) find evidence that free agency has pulled wages up closer to MRPs, the question is, have wages stopped at MRPs or have they surpassed them? Recent research suggests it is likely the latter. Burger and Walters (2008) state that, “within a few

years of the onset of free agency, expectations about the value of players adjusted upward so rapidly that not only were salaries commensurate with MRPs but far above them.”

What is more, the researchers claim that estimating MRPs is “more complex than previously thought,” as “MRPs are affected by the size in the market in which they play . . . not uniform across teams” (Burger and Walters 2008). Studies such as Burger and Walters (2008) and Vrooman (1996) show that free agent contracts have gone from $W < MRP$ to $W > MRP$, quickly surpassing $W = MRP$. These two primary studies make valuable contributions to the understanding of the MLB labor market and why it experiences such inefficiencies.

An important observation made by Vrooman (1996) is that the collusion period of the 1980’s was successful in suppressing free agent wages. This is important because MacDonald and Reynolds (1994) use data from the 1986 and 1987 seasons, years which experienced widespread collusion against free agents. Vrooman (1996) debunks the conclusion that players are generally paid in congruence with MRPs during this time, as he cites multiple studies that find $W > MRP$ in the seasons before and after the collusion period. For example, Bruggink and Rose (1990) find that free agents were paid 22% over their MRPs in 1984. Zimbalist (1992) finds that free agents were paid 28% and 39% over their MRPs in 1988 and 1989, respectively.

Vrooman (1996) then goes on to explain why these repeated inefficiencies occur. He suggests that it is not free agency, but the free agency eligibility rules that cause overcompensation (Vrooman 1996). This is because the eligibility requirement of at least six years of MLB service artificially restricts labor supply (Vrooman 1996). When supply is constrained, the supply curve shifts leftward and labor prices increase. Moreover, monopoly power is directly correlated with scarcity. Therefore, the greater the shortage of available players, the greater the power of free agents to act monopolistically.

With only a few agents and even fewer superstars available each season, free agents can use their market power to hold wages above MRPs. To illustrate this, first imagine the quantity of every player on every team. With a 40-man roster and 30 teams, there are approximately 1,200 Major League players at any given time. Then reduce this figure to just the amount of free agents; for the 2024 to 2025 season, there were only 292 free agents (MLB 2025). Now imagine you are a club in the market for left fielders; this number shrinks to 19 (MLB 2025). If looking for a designated hitter, there are only 6 agents available (MLB 2025).

This exercise demonstrates how significant free agent shortages can be during a single season. Vrooman (1996) understands the importance of labor supply availability, and attributes supply shortcomings to the current free agency eligibility rules. Similarly to Scully (2004), he recommends a restructuring of eligibility criteria to mitigate the issue (Vrooman 1996). Vrooman's (1996) calculations predict that dropping the eligibility requirement from six years of MLB service to four years would increase free agent supply by 15%.

As a supplement to Vrooman's (1996) observation, Duane Rockerbie (2009) studies players' awareness of their monopoly power and their ability to exploit it. He does so by (i) observing the behavior of agents and (ii) studying negotiated salaries as a function of available players in the market (Rockerbie 2009). Rockerbie (2009) finds that potential free agents will occasionally defer their free agency by exercising an option year, meaning they will remain at their current salary for another season. They will do so in anticipation of enacting their free agency status during a trading period where there is a lower number of available agents in the market, particularly for their position (Rockerbie 2009).

The (potential) free agents are thus acting strategically to maximize their monopoly power. By waiting to negotiate with teams when fewer players are available in the labor market,

they increase their leverage. As Vrooman (1996) would likely predict, Rokerbie (2009) finds that negotiated free agent salaries are a declining function of the number of free agents available, indicating an inverse relationship. However, his study only looks at catchers and shortstops. Both Rokerbie (2009) and Vrooman (1996) make it evident that free agents have significant monopoly power, indicating the existence of a bilateral monopoly market.

Burger and Walters (2008) make similar findings to the former researchers. However, they go into further detail about teams' shortcomings when resisting free agent monopoly power. They make two primary conclusions in their research: (i) teams consistently overvalue free agents, and (ii) teams repeatedly fail to learn from their previous mistakes and do not discount bids as a function of their market size (Burger and Walters 2008).

While strategic free agent behavior and player shortages are possible explanations for $W > MRP$, the Winner's Curse is another. The Winner's Curse is defined as the "tendency for the winning bid in an auction to exceed the intrinsic value or true worth (of a player)" (Hayes 2024). Once free agency was institutionalized, the free agent labor market began to resemble that of an auction market. Therefore, behaviors observed in auction markets began to occur in the MLB, such as bidding wars and the Winner's Curse.

Typically, bidders in an auction market learn to avoid the Winner's Curse when they are able to "learn from past auction outcomes and modify their bidding behavior" (Burger and Walters 2008). Not only do Burger and Walters (2008) observe that teams fail to adjust their bidding behavior based on previous failures, they also find that teams may suffer from information deficits. Therefore, the Winner's Curse can result from a team acting on less than perfect information, also known as asymmetric information. Asymmetric information is when one party has better access to knowledge (about a player) than others.

Information deficits are likely present when a free agent is signed with an unfamiliar team. The player's current team has better knowledge than an unfamiliar team of his performance, routines, ability to work with others, and any other factors that might influence his future performance (Vrooman 1996). Bidders with information advantages can more accurately predict player performance and value than others (Oswald, 2016). If a player's current team is outbid by an unfamiliar team, it is possible that the unfamiliar team overvalued the player due to imperfect information.

Not only are unfamiliar teams disadvantaged by asymmetric information, they also bear an increased risk that players will perform substandardly following migration (Burger and Walters 2008). Players who sign with new teams are more likely to experience injuries, struggle with interplayer synergy, or lose playing time than those who stay with their previous team (Oswald 2016). Therefore, the consequences of the Winner's Curse in this instance can be exacerbated due to the correlation between reduced player performance and migration to an unfamiliar team. Burger and Walters (2008) point out that owners may neglect this risk, and thus, fail to discount their bids accordingly.

Kahn (1993) finds yet another example of the Winner's Curse in the MLB but not with free agents. He infers that clubs have an increased chance of falling victim to the Winner's Curse when in salary negotiations with players who are within their 5th year of MLB service (Kahn 1993). This initially seems counterintuitive, as teams have exclusive rights to 5th year players' services and will not lose them to other teams at this time because free agent eligibility conditions require at least six years of MLB service. However, teams recognize that players in their 5th year will soon be free agents and may want to avoid an auction market with other teams

in the coming season (Kahn 1993). Therefore, teams may treat players as if they were free agents, even if they are not (Kahn 1993).

Even though an auction is not yet at stake, Kahn's (1993) research implies that 5th year players possess some bargaining power that may cause inefficient outcomes similar to the effects of free agent monopoly power. Both 5th year players and their teams have some knowledge about what they might earn as free agents based on previous years of performance, which players can use to their advantage during negotiations (Kahn 1993). Additionally, clubs may fear losing these players if they are core contributors to team performance, causing them to overestimate values (Kahn 1993).

Teams in this case essentially pay a premium to ensure they will not lose 5th year players in a bidding war, and in return, the players will often sign multiyear contracts with high wages (Kahn 1993). Note that the players have more security in this scenario because they hedge themselves against injury risk, which could potentially lessen their future values as a free agents. Despite this, Kahn (1993) finds that in general the Winner's Curse applies to those who enter long term contracts with 5th year players because teams will likely have to outbid players' expected values in their first year as free agents in order to strike a deal.

The Winner's Curse is tenacious in the MLB labor market due to information asymmetries, migration risks, and fears over losing soon-to-be free agents. However, according to Burger and Walters (2008), the most detrimental occurrences of inefficiency arise from neglecting market size in free agent valuations. Burger and Walters (2008) study this phenomenon by estimating the relationship between a team's output of wins and its revenue, producing a team-specific marginal win value (MWV). The team's MWV is then multiplied by

the player's marginal output of wins to determine MRP (Burger and Walters 2008). This method is very similar to Scully (2004).

Burger and Walters (2008) acknowledge that MWV varies from team to team. More specifically, it varies drastically between teams in large markets and teams in small markets. Access to a large metropolitan area increases revenue because a high local population is correlated with increased demand for team output. A rightward shift in output demand increases the price of the output sold, causing an increase in labor demand (derived demand) and therefore prevailing wage.

Burger and Walters (2008) demonstrate the impact of market size by calculating the value of wins on various teams in various seasons. For example, each additional win in the 1982 season added \$316,000 in revenue for the NY Yankees (large market) and only \$241,000 in revenue for the Toronto Blue Jays (median sized market) (Burger and Walters 2008). They find the gap between markets has grown more severe over time, meaning teams have become significantly distant from each other in terms of revenue (Burger and Walters 2008).

The result of team revenue discrepancy is twofold; (i) small market teams have failed to recognize that players' MRPs are lower in absolute terms than for large market teams and therefore, often overpay for free agents, and (ii) large market teams are more attractive to free agents due to their ability pay higher salaries (Burger and Walters 2008; Krautmann and Oppenheimer 1994). Therefore, small market teams often experience the Winner's Curse because they do not discount bids in congruence with their market size, and the existence of large market team bids in an auction increases this likelihood (Burger and Walters 2008).

In summary, there are many causes of wage inefficiency in the current MLB labor market. The first source of inefficiency is the persistent monopsony power of teams used against

non-free agents. As for free agents, inefficiencies arise from failure to account for market size, information asymmetries, and migration-related injury risk. It is important to note that all of these sources could have caused $W > MRP$ under the Reserve Clause; however, the monopsony power of the League to pull wages downward was overpowering, and instead, $W < MRP$ resulted during that time. Free agency has relieved certain players from the dominance of this power and enabled all of the previously listed inefficiencies to occur at full force.

Furthermore, newly created sources of inefficiency have emerged since the restructuring of the Reserve Clause such as restrictive free agent eligibility criteria and strategic free agent behavior, both of which constrain free agent supply and give players monopoly power. Ultimately, inefficiency exists in both periods. The transfer of power from the League to players once they become free agents shifts wage inefficiency from $W < MRP$ to $W > MRP$.

Section 6: Talent Distribution

The implications of free agency on talent distribution within the League is another point of concern for economists. During the initial arbitration case that won players the right to free agency, owners were fearful that free agents would favor large market teams, effectively destroying competitive balance (The Spokesman Review 1975). This is foreshadowed by Burger and Walters' (2008) findings that large market teams can be more attractive to free agents in terms of salary bids.

One way economists can confirm or deny the validity of these fears is by observing the Coase Theorem (or lack thereof) in the MLB labor market, as well as the positive or negative effects free agents have on team performance. If the Coase Theorem applies to the MLB labor market, the transfer of rights from one party (ie., the owners) to another (the players) has no

effect on distribution outcomes. In other words, the institution of free agency does not affect talent distribution.

The conditions of Coase Theorem are very similar to that of perfect competition, i.e., perfect information, no transaction costs, efficient quantity of inputs and outputs, etc. Therefore, the observance of the Coase Theorem would likely be paired with optimal outcomes and efficiency. Based on the previous section, there are multiple known inefficiencies in the MLB labor market. Moreover, the causes of these inefficiencies have changed after the restructuring of the Reserve Clause. With this in mind, it is likely that Coase Theorem will not hold true.

If this is the case and player distribution has changed under free agency, then team owners' fears over market liberalization may be valid. However, the change in talent distribution must be paired with positive returns on free agent investments in order to truly threaten competitive balance. If acquiring free agents does not significantly impact team winning percentage, then a change in talent distribution patterns should not affect competitive balance. By determining whether acquiring free agents has a positive impact on team performance, economists can confirm or discredit the owners' concerns. This gives way to the second question this paper attempts to answer:

“Has the institution of free agency affected talent distribution patterns, potentially threatening competitive balance?”

Competitive balance is critical for all baseball stakeholders. Every team wants to win the championship, every fan wants their team to win, and the League wants teams and fans to be invested in game play outcomes. Although teams are expected to covet wins and engage in competitive behavior, too many predictable outcomes are undesirable; dynamic parity excites fans (Gordon 2020). Hence, all teams derive monetary value from competitive balance

(Krautmann and Oppenheimer 1994). In other words, competitive balance is a public good, meaning it is shared and beneficial (Krautmann and Oppenheimer 1994). If one team were to win the World Series year after year, the demand for baseball (or for the wins of the team) would likely decrease due to predictability and lack of excitement, also known as static parity (Gordon 2020).

To illustrate this concept, one can revisit what is commonly referred to as the “1990’s Yankee Dynasty.” The 1990’s Yankee Dynasty occurred when NY Yankee owner, George Steinbrenner, acquired many star agents at high salaries (Mearns 2023). This team went on to win four World Series championships in five years (Mearns 2023). It is important to note that the luxury tax was not in existence at the time. However, it is unclear that the soft cap would be a significant deterrent, as the Yankees have a history of paying the tax in all but two years since its inception (Mearns 2023). Regardless, many attribute the success of the team to the cohort of famous free agents signed during that period.

If this winning streak were to continue, it is possible that all those who were not Yankees or Yankee fans would begin to lose interest due to lack of excitement. This paper aims to determine whether dynasty-like eras are further enabled by free agency or (as the Coase Theorem would imply) they are no more frequent than under the Reserve Clause. It is possible that the 1990’s Yankee Dynasty would have occurred regardless of the institution of free agency because the available talent would be identically distributed. Conversely, if the Coase Theorem does not hold in the MLB labor market, then it is likely that talent distribution outcomes have changed, possibly having a negative impact on competitive balance.

In order for free agency to truly threaten competitive balance, two things must occur; (i) the baseball labor market inclusive of free agency does not adhere to the Coase Theorem, and (ii)

the acquisition of free agents positively affects team winning percentage (Krautmann and Oppenheimer 1994). Krautmann and Oppenheimer (1994) seek these conditions in their paper which covers the migration patterns of free agents from the 1989 through 1991 seasons with an emphasis on the movement of players from small to large market teams. Using this data, they develop a probability equation to predict the chances that a given free agent will migrate to another team (Krautmann and Oppenheimer 1994). Lastly, Krautmann and Oppenheimer (1994) determine whether or not the addition of new free agents positively affects team outcomes.

Krautmann and Oppenheimer (1994) assume “free agents view migration as an investment allowing them to maximize utility.” Therefore, a free agent has both monetary and nonmonetary preferences (Krautmann and Oppenheimer 1994). What is unique about the baseball labor market compared to other markets is that the ownership rights to a resource are being transferred to the resource itself i.e. the players (Krautmann and Oppenheimer 1994). Therefore, Krautmann and Oppenheimer (1994) find that the decision for a player to switch teams under free agency includes the player’s preferences, which team owners do not consider in their trades.

The probability equation Krautmann and Oppenheimer use is

$$(5) P = (\Delta I, \Delta E, \Delta N) ,$$

where P is probability of migration, ΔI is additional salary income from moving, ΔE is additional non-salary income (commercials, sponsorships, appearances) from moving, and ΔN is additional non-monetary net benefit from moving (location-specific amenities and moving costs) (Krautmann and Oppenheimer 1994). They also assume that player additional salary income depends on MRP, which increases with market size (Krautmann and Oppenheimer 1994).

The results of their findings indicate that the institution of free agency is correlated with a change in player distribution outcomes such that large market teams tend to retain more free agents than small market teams (Krautmann and Oppenheimer 1994). This makes sense given that the sources of inefficiency in the MLB labor market have changed since free agency. Therefore, the Coase Theorem does not hold, fulfilling the first condition for free agency to hurt competitive balance. However, Krautmann and Oppenheimer (1994) also claim that acquiring free agents in general has a small impact on wins. Therefore, their findings indicate that free agency has not not caused serious negative consequences regarding competitive balance because although (i) the labor market does not adhere to the Coase Theorem, (ii) the acquisition of free agents does not have a significantly positive effect on team performance (Krautmann and Oppenheimer 1994).

Gordon (2020) supports Krautmann and Oppenheimer's (1994) research by finding that high dominance teams, which he calls "extreme" teams, were more than twice as frequent before 1961 than after 1975. In fact, Gordon (2020) finds evidence of improvement in competitive balance. Although they still occur, there have been fewer team dynasties and losing streaks after the restructuring of the Reserve Clause (Gordon 2020). Based on this research, it is likely that the occurrence of the 1990's Yankee Dynasty is not directly attributable to the number of free agents acquired. However, it is possible that without free agency, those particular players would not be in pinstripes.

Krautmann and Oppenheimer (1994) explain why distribution outcomes have changed with a few key points. Recall that under the Reserve Clause, player preferences were not taken into consideration when team owners decided to make trades. Krautmann and Oppenheimer (1994) find that player preferences have a significant impact on migration decisions and

therefore talent distribution. For example, players are less likely to migrate if they have changed teams multiple times in the past due to the nuisance of moving (Krautmann and Oppenheimer 1994). Players also heavily favor the extra non-baseball income that migration may provide, which often justifies movement from a small to a large market team (Krautmann and Oppenheimer 1994). The impact of player preferences paired with differing causes of inefficiency in the MLB labor market under free agency is evidence that Coase Theorem does not hold.

As for the near zero impact of free agents on winning percentage, Krautmann and Oppenheimer (1994) suggest it is related to the reverse-order draft, which is designed to improve team composition. Despite the ability of large market teams to acquire some of the most attractive free agents, the draft may somewhat level the playing field (Krautmann and Oppenheimer 1994). Gordon (2020) notes that other changes in the MLB may also contribute to the appearance of competitive balance in the sport. The introduction of divisional play and wild card spots have changed the structure of championship tournaments, allowing lesser teams more opportunities in the postseason (Gordon 2020). Therefore, it is important to recognize that the institution of free agency did not occur in a vacuum, and that other structural changes may have neutralizing effects that make free agents seem less impactful than they truly are. This is especially true when looking across multiple seasons in which many changes took place.

In summary, the institution of free agency does not appear to pose a major threat to competitive balance because of the apparent little effect the acquisition of free agents has on win percentage, possibly due to counterbalances like the draft or wild card teams (Krautmann and Oppenheimer 1994; Gordon 2020). As expected, the Coase Theorem does not hold true in this market (Krautmann and Oppenheimer 1994). As a result, free agency has impacted many aspects

of the MLB including talent distribution, but it seemingly has not caused a major deterioration of competitive balance.

Conclusion

The Major League Baseball labor market has shifted from a monopsony market to a bilateral monopoly market due to the eradication of the Reserve Clause. Once free agency was instated, market power shifted dramatically from teams to players, and the power struggle between monopsonistic teams and monopolistic agents began. The transformation did not just affect player wages, but also the distribution of talent across the League.

The position of this paper is that free agents are generally overpaid relative to their marginal revenue products of labor. It is clear that monopsony power still exists in the baseball labor market, particularly against non-free agents. However, evidence suggests that when faced with an auction market, teams regularly fail to account for market size and asymmetric information among other important factors.

Erroneous calculations paired with the inability to learn from previous auctions results in many teams experiencing the Winner's Curse. In addition, free agents strategically exacerbate these problems by deferring their free agency and further restricting labor supply. It appears that the disparity between wages and MRPs has become more severe over time, meaning wage inefficiency has grown.

The current restrictions on free agency eligibility result in two simultaneous inefficiencies where $W < MRP$ and $W > MRP$ for non-free agents and free agents, respectively. This paper supports the argument that allowing players to become free agent eligible closer to the recuperation of their development costs (or as Scully (2004) suggests, allowing all players to be free agents) would mitigate some of these inefficiencies. The current structure is inept in

restraining large market teams' hefty expenditures on free agents, forcing small market teams to overbid for any chance of winning.

The discrepancy in team market size has intuitively caused free agents to concentrate in large markets because of their attractiveness to free agents. This would be of great concern to all baseball stakeholders if it significantly impacted competitive balance, but the acquisition of free agents appears to not have a substantial positive influence on team winning percentage.

Therefore, although the Coase Theorem does not hold - meaning distribution outcomes changed after the transfer of rights from owners to players - competitive balance has not been harmed.

The draft among other structural changes are likely counterbalances to any positive effects of free agents, potentially causing agents to appear less important than they truly are to team outcomes.

The primary takeaway from the literature reviewed in this paper is that major inefficiencies do exist in the baseball labor market. Both the distribution and compensation of players is suboptimal. A restructuring of the MLB labor market may mitigate these issues but is unlikely as the League attempts to preserve its power. Ideas such as expanding free agency to encompass more players or enforcing stricter salary caps are tools economists have suggested. If implemented, sports economists will rush to produce new evaluations of the fascinating baseball labor market.

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