

STATE INCOME TAX EFFECTS ON MLB FREE AGENT
CONTRACT NEGOTIATIONS IN THE AREAS
OF SALARIES AND BONUSES

by
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ABSTRACT

This paper examines the relationship between state income tax rates and Major League Baseball (MLB) free agent salaries. Previous research in this area finds that teams located in states with a higher tax rate pay their players higher salaries. This may put teams in high income tax states at a disadvantage when bidding for free agents against teams in low or no income tax states, as players and their agents consider net-of-tax salary offers. This paper expands on previous research by evaluating whether a similar relationship exists between state income tax rates and bonuses. This paper also differs from prior research by using the sabermetric statistic wins above replacement (WAR) to represent a player's prior levels of performance in the regression models. Prior research uses combinations of traditional statistics such as on-base percentage, batting average, and fielding percentage. This paper's findings are consistent with those of previous studies as state tax rate is a significant variable in the regression analysis for salaries. This paper's results also provide evidence that WAR is a significant explanatory variable in the salary regression. No variables were significant in the regression analysis for bonuses, perhaps because of the small sample size. This paper details the free agency process, the types of bonuses awarded to MLB players, the effects of state taxation on the salaries of professional athletes, the quantitative analysis, and the implications of the analysis results.

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INTRODUCTION

When a professional baseball player's contract expires after six years of service in Major League Baseball (MLB), he has the opportunity to enter the baseball labor market as a free agent. The player and his agent negotiate contract options with several teams, and the player chooses the one that appeals to him most. The player and teams consider many factors during this time of negotiation, such as the player's past performance, the contracts of players with similar skill sets, age, and position(s). These players, especially the highest-paid ones, need to also consider state income tax, as these rates vary greatly across states and can make a significant difference in after-tax salary.

One highly publicized example of the effect of state income taxes on a professional athlete's salary was Cliff Lee's free agency before the 2010 season. The New York Yankees and the Texas Rangers offered him contracts first. At the time, New York's highest marginal income tax rate was 8.9% and Texas does not have a state income tax. If the Yankees offered \$140 million, Lee would receive an after-tax amount of \$127 million. (This simple illustration disregards federal income tax because it would be the same percentage in both scenarios.) For the Rangers to match that after-tax offer, they could offer \$127 million. The Yankees would have to pay Lee \$13 million more for him to consider the offers equal, putting the Rangers at a significant financial advantage (Beaman, 2010; Costa, 2010). The wide range of state tax rates along with the large salaries of these players can lead to significant state income tax effects that should be considered in free agent negotiations.

Prior research on this topic has examined the relationship between state income tax rates and player salaries. Ross and Dunn (2007) studied the effect of state income tax

on the salaries of MLB All-Stars. They hypothesize that teams in states with a higher income tax rate must offer higher before-tax salaries to compete for the best players. Their research supports this hypothesis as their analysis shows that for each 1% increase in the state income tax rate, a team must offer a 3.3% higher salary. Alm, Kaempfer, and Sennoga (2012) added to the literature on this topic. Their research centers on the general theory of tax incidence, which holds that tax incidence shifts from mobile to fixed factors. In Alm et al.'s study, free agent players are mobile factors and teams are fixed factors. The researchers use extensive past performance data as controls in the empirical analysis, and similar to Ross and Dunn, they find that for each percentage point increase in the state income tax rate, the team must offer between \$21,000 and \$24,000 more for a player's salary. This indicates that teams in states with no state income tax, or with low state income tax rates, have an economic advantage over teams located in states with high state tax rates. Veloitis (2013) employs the concepts from Ross and Dunn's and Alm et al.'s research to develop equations for players, agents, and teams to use in contract negotiations to account for income tax effects. These equations range from basic to complex. Most of the other literature about professional baseball salaries explores the complex implications of "jock taxes" levied by states on the portion of income that players earn while playing in that state.

Players and agents focus on salary offers during free agent contract negotiations, and salary is the most highly publicized aspect, but the contract has several other parts as well, including bonuses. Contracts frequently include team promises of bonuses to players for exceptional individual performance. A pitcher might qualify for a bonus from his team for winning the Cy Young Award, an All-Star selection, or the Gold Glove

Award, among numerous other achievements. Hitters can also earn bonuses, most commonly by winning the Most Valuable Player Award, an All-Star Selection, the Silver Slugger Award, or the Gold Glove Award. To this time, no published research has been done on how state tax rates affect bonus amounts.

This paper explores the relationship between the salary paid to free agent players and the income tax rate of the state in which the team is located. I also analyze relationships between the average amounts of bonuses offered to players by teams and the income tax rate of the state in which the teams are located. I made two predictions. First, I expect that my analysis of player salaries will produce results consistent with that of previous research. Second, I hypothesize that in the analysis of performance bonuses, the results will demonstrate that teams in states with a higher income tax offer individual performance bonuses of greater dollar amounts than teams in states with a lower income tax. I analyze the salaries and bonuses of the top 156-paid MLB players (as determined by base salary paid in the 2014 season). I build on previous studies by using the statistic “wins above replacement” (WAR) as a measure of a player’s previous performance. The results of my analysis show that state income tax is significant with respect to salaries, but not significant with respect to bonuses.

My paper begins with a complete description of the free agency process and an explanation of the applicable baseball terms. I then provide a review of the literature that has already been published on the topic. Next I describe my method of analysis and present the results and implications. Lastly I discuss the study’s limitations and provide my recommendations for future research in this field.

BACKGROUND AND LITERATURE REVIEW

The Free Agency Process

MLB players have unionized to form the Major League Baseball Players' Association (MLBPA). The MLBPA and the team owners (or "Clubs") negotiate and jointly agree to abide by the Collective Bargaining Agreement (CBA). The CBA functions as any other union contract: to establish the terms of employment, including topics such as player rights, benefits, and compensation. This contract also describes the free agency process in detail. The current CBA took effect on December 12, 2011, and will expire on December 1, 2016 (Major League Baseball, 2011). At times the MLBPA and the Clubs have not been able to reach an agreement on the CBA, resulting in a "lock out" or a players' strike during which teams do not allow players into the facilities, or players refuse to show for spring training and/or regular season games.

Not all players are granted free agency when their contracts expire. If the player has one or two years of experience in the major leagues, the player is still under the reserve clause and must accept the team's terms of contract, including salary and incentives (such as performance bonuses, free tickets per home game, and suites on road trips). A player with three to five years of service has the right to negotiate the terms of his contract. If the team and the player cannot reach an agreement, the player has the right to arbitration (Conrad, 2011; Fazel & Hadley, 2006). During the arbitration process the player and the team each submit an offer to an independent arbitrator. MLB's arbitration process is unique compared with other professional leagues in that the arbitrator must pick one of the two offers. The arbitrator may not develop a third, intermediate option. This motivates the negotiating parties to provide reasonable offers (Zygmunt, 2010).

After six years of experience the player enters free agency upon the expiration of his contract (Conrad, 2011; Fazel & Hadley, 2006). The CBA has used this structure of determining player negotiation rights based on experience in the league since the first CBA was established in 1976 (Conrad, 2011).

During the free agency process, teams make contract offers to a player. It is an auction model, as the highest-bidding team usually wins the talent of the player (Zygmunt, 2010). Teams should offer to pay a price for the player that they believe is equal to or below the value that the player will add to the franchise. Each front office determines player value differently, but some common characteristics they consider are past performance, position(s), age, and intangible qualities such as leadership ability and clubhouse chemistry (Conrad, 2011). The player and his agent also weigh many factors in their consideration of the teams' offers, such as amount of salary, amount of signing bonus, incentives, no-trade clauses, and location of the team. Players earn high salaries, so the state income tax consequences are substantial and should also be considered in the negotiation. The 2014 minimum salary for an MLB player was \$500,000 (Major League Baseball, 2011). As a result, most all MLB players fall into the highest tax bracket for federal and all state taxes.

A player may hire an agent to serve as his representative in negotiations concerning the player's employment. These agents are common for professional athletes as well as other types of entertainers. They are experts on employment negotiations for highly paid individuals. These agents are compensated as a percentage of the player's signing bonus and/or salary, so the agent has direct incentive to obtain the largest possible salary for the player. The agent must be certified by the MLBPA to negotiate

with a team on a player's behalf. A player can have only one agent representative at a time, although he may hire and fire as many agents as he pleases throughout his career. The Office of the Commissioner supplies the teams with a list of certified agents and whom each player has designated as his agent (Major League Baseball, 2011). The agent handles most of the work of the negotiations, which allows the player to focus on his job and his family. An agent must thoroughly familiarize himself with the Major League Constitution and the CBA so that he understands both the position and leverage of his client, as well as the position and leverage of the teams (Conrad, 2011).

The Uniform Player Contract provides the basic structure and rules included in MLB player contracts. The CBA mandates use of the Uniform Players Contract by all players and teams (Major League Baseball, 2011, p. 277-289). The document provides spaces for the parties to include the agreed upon term of the contract and the semi-monthly salary installment amount. The parties include signing bonuses, performance bonuses, and other contract specifics in the "Special Covenants" section at the end of the contract. Otherwise, the areas of loyalty to the Club, baseball promotion (marketing and advertising campaigns), and pictures and public appearances are established in the contract to be followed uniformly by all players and Clubs. Other areas of agreement include the player's truthful representation of his ability, physical condition, and financial interests in the team. He also must agree to play solely for the Club, to not participate in other sports that could inhibit his ability to play baseball, to accept assignment to a minor league affiliate as the Club chooses (or as otherwise agreed upon in the Special Covenants), to provide medical information, and to report to the Club in a timely manner. The "No Salary Reduction" section guarantees the player the entire salary amount

promised by the Club in the contract, regardless of injury or other cause for inability to play, except suspension for failing a drug test (Major League Baseball, 2011).

Additionally, the Uniform Player Contract sets forth the Club's obligations to the player to pay his salary and bonuses in a timely fashion and provide moving allowances as dictated in the CBA. Finally, the contract establishes the procedures for contract termination by either the player or the Club, non-compliance with MLB and/or Club player rules and regulations, contract renewal, and the instance of a player getting drafted into the military or other national emergency situation (Major League Baseball, 2011).

Applicable Baseball Terminology

Wins Above Replacement (WAR)

The empirical analysis presented in this paper uses the sabermetric statistic WAR as published by Baseball-Reference.com. Sean Smith developed WAR in 2003, and now many versions of it exist. Each source that publishes WAR uses a slightly different method of calculating the statistic. For the purposes of this research, I used WAR data solely from Baseball-Reference.com, which describes this statistic as “a single number that presents the number of wins the player added to the team above what a replacement player (think AAA or AAAA [level]) would add.” In general, a number of eight or greater indicates a Most Valuable Player level of play. A number of five or greater indicates an All-Star level of play. A number of two or greater indicates a level of play typical to that of an MLB starter. A negative number indicates that the replacement player would have added more wins (or partial wins) to the team.

Runs created or lost by the player forms the basis for developing WAR. Usually about ten runs equal one win. For this reason, Baseball-Reference.com includes one decimal place when reporting WAR (Sports Reference LLC, WAR Explained, Converting Runs to Wins).

The calculation of WAR includes hundreds of complex steps. Two mathematical differences serve as the foundation to the calculation: the player's runs created/lost compared over average, and average runs created/lost over the replacement level. The differences in these two comparisons are summed to find the difference in runs created/lost between the player and the replacement level, as indicated by this formula:

$$\text{Players Runs over Replacement} = \text{Player_runs} - \text{ReplPlayer_runs} = (\text{Player_runs} - \text{AvgPlayer_runs}) + (\text{AvgPlayer_runs} - \text{ReplPlayer_runs}).$$

The player is one specific individual, for whom the WAR statistic is being developed. "AvgPlayer_runs" is the average of all MLB players' runs created/lost. Baseball-Reference.com and FanGraphs (another well-respected sabermetrics source) define a player of replacement level, "ReplPlayer_runs," as a level of play consistent with a .280 batting average. This is an area in which each source that publishes WAR uses discretion in defining the level of play of a replacement player (Sports Reference LLC, WAR Explained).

The calculation of player runs created/lost differs for position players and pitchers. WAR for position players encompasses six components:

1. Batting runs
2. Baserunning runs

3. Runs added or lost due to grounding into double plays in double play situations
4. Fielding runs
5. Positional adjustment runs
6. Replacement level runs (based on playing time)

The first five components are included in the first half of the above equation, as they are compared to the league average. The sixth component corresponds to the second part of the equation (Sports Reference LLC, Position Player WAR).

WAR for pitchers encompasses two components: runs allowed (both earned and unearned) and innings pitched. Analysts then make adjustments to this record to account for level of opposition, team defense, and ballpark factors (Sports Reference LLC, Pitcher WAR). The specific calculations for both position players and pitchers are extensive and tedious, and their description is beyond the scope of this discussion.

Ultimately, baseball teams want wins, not just runs. Baseball-Reference.com uses PythagPat to convert the difference in runs between the player and the replacement level into the number of wins created/lost by the player for his team (Baseball-Reference.com, WAR Explained). PythagPat is a very accurate win-loss estimator based on Bill James' Pythagorean Theorem (Baseball Prospectus, n.d.).

Previous authors of research in the area of baseball salaries used other statistics to measure player performance, as WAR is relatively new. Alm, Kaempfer, and Sennoga (2012) used on-base percentage plus slugging percentage (OPS) and fielding percentage (FP) for position players, and earned-run average (ERA), wins (W), win-loss average (W/L), innings pitched (IP), strikeout-to-walk ratio (K/BB), and saves (S) for pitchers.

Ross and Dunn (2007) used defensive putouts (PO) and OPS to evaluate position players. Their research did not include pitchers. Other statistics that are also generally considered to demonstrate a position player's quality include batting average, home runs, and runs batted in.

These metrics are intended to measure a player's ability. Most of them are only a count of specific occurrences or a combination of simple mathematical operations based on these counts. They can provide an incomplete, and perhaps misleading, depiction of a player's ability when considered in isolation. My analysis uses WAR rather than any of the other aforementioned metrics because WAR encompasses all of the intended value implications of the above statistics. WAR demonstrates, in one number, the value the player adds to his team. This is what management cares about. Team owners must consider contracts as long-term investments in talent, so player value measurements are incredibly important. Although past performance cannot guarantee future performance, past performance data is all that the teams have to evaluate the players. WAR takes performance statistics beyond measuring a player's ability to measuring a player's value.

Incentives: Player Bonuses for Individual Performance

Performance bonuses are special incentives agreed on by a team and the player and are included in the player's contract. These are amounts above the player's annual salary that the team promises to pay if the player accomplishes specific performance levels or wins notable individual performance awards. Some of these awards can be given to position players and pitchers, while others are specifically for one or the other.

The Most Valuable Player (MVP) award is given to two players each season – one in the National League (NL) and one in the American League (AL). The winning player can be either a pitcher or a position player. The Baseball Writers Association of America votes at the conclusion of every season, after the playoffs, to determine the winners. Some player contracts include a bonus only for winning the MVP voting, while others also include smaller bonuses for finishing in the top five in the MVP voting.

Additionally, an MVP is chosen for each round of the playoffs in each league – the NL Division Series (NLDS), the AL Division Series (ALDS), the NL Championship Series (NLCS), and the AL Championship Series (ALCS). Also, one World Series MVP is selected at the conclusion of the World Series. Some players have incentives for these MVP awards as well. For example, Carl Crawford's current contract (2011-2017) states that for an ALCS MVP selection he will be awarded a bonus of \$75,000, and for a World Series MVP selection he will be awarded \$100,000.

The most common type of incentive included in players' contracts is for a selection to the All-Star Game (ASG). The ASG is played in the middle of July every season between the best players from the NL and the AL. The event rotates between MLB parks each year. Fan balloting online and in MLB ballparks determines the first eight roster spots in the NL and the first nine roster spots in the AL. Next, MLB players vote to determine eight roster spots in the NL and nine roster spots in the AL, as well as five starting pitchers and three relief pitchers for each league. Players may vote for their own teammates. Then the managers of the two All-Star teams and the Office of the Commissioner pick nine players in the NL and seven players in the AL to include on the rosters. For both leagues, five of those players must be pitchers. Lastly, fans vote online

for the final member of each roster. The managers choose which players to list on this “last chance” ballot (Major League Baseball, 2011). In general, the bonuses promised to players for an ASG selection are smaller than those promised for a league MVP. The most likely reason for this is that only two players receive the MVP award each year, while the ASG features a total of 68 players – 42 position players and 26 pitchers.

The Gold Glove Award is granted annually to one player at each position in each league, for a total of 18. One is given to each specific outfield position – left field, center field, and right field – as opposed to three generic outfielder awards. This award recognizes the top defensive player at each position. Rawlings¹ sponsors this award and supplies the trophies. The managers and coaches vote for the winners before the completion of the regular season. They cannot vote for players on their own team. They only vote on the players in their league (Rawlings, n.d.).

The Silver Slugger Award is granted annually to one player at each position in each league, for a total of 18. In the NL the award is also given to a pitcher, because pitchers bat in the NL. In the AL, the award is given to a designated hitter rather than a pitcher, because the pitcher does not bat in the AL. For the outfield positions, three outfield awards are given, but there does not have to be one each for left field, center field, and right field. The Silver Slugger Award is sponsored by Louisville Slugger,² which describes the award as the top offensive award given annually in professional baseball. Louisville Slugger provides the trophies. MLB managers and coaches choose the winners. They are not allowed to vote for players on their own team (Louisville Slugger, n.d.).

¹ Rawlings is a sports equipment and apparel manufacturing company.

² Louisville Slugger is a baseball and softball equipment and apparel manufacturing company.

The Rookie of the Year award is another notable award granted by the Baseball Writers of America each season. It is usually not pertinent to a discussion regarding free agents, as players that sign their contracts as free agents already have league experience, and therefore do not qualify for the Rookie of the Year award. The one exception is for international players who are not drafted into MLB – they are free agents from the start. Therefore, it is possible for an international player to sign as a free agent before his rookie season, in which case he would be eligible to receive this award. There are two players of this type included in the data set – Masahiro Tanaka and Jose Abreu.

The Cy Young Award is also granted after the conclusion of the postseason to the most outstanding pitchers of the regular season. One pitcher is chosen in each league, for a total of two winners each year. The pitcher that wins this award may also win the MVP in his league for that season. For example, in 2014, Clayton Kershaw won both the NL Cy Young Award and the NL MVP. If a player's contract includes bonuses for both of these awards, and if he wins both of them in the same year, he will receive both of the bonuses.

Lastly, players may have individualized incentives written into their contracts based on personal or historic milestones, or incentives for older players that encourage health and longevity. Albert Pujols' current contract is a great example of the first scenario. Spotrac.com reports that his contract with the Angels includes a bonus of \$3 million if he achieves 3000 career hits. If he breaks the MLB all-time home run record he receives a bonus of \$7 million. Aside from that, his performance bonuses are structured such that if he receives any of the annual awards discussed above, his bonus is \$875,000. Additionally, older players may have incentives for a certain number of games started or

innings pitched. For example, AJ Burnett, 38 years of age, receives a bonus of \$500,000 for starting 24 games in a season and \$500,000 again for starting his 27th game. His 30th start of the season earns him \$750,000. Dan Haren, 34, receives bonuses for games started, like Burnett, but his contract also includes incentives for number of innings pitched. For 150, 160, and 170 innings pitched in a season his bonus is \$250,000. For 180 and 190 innings pitched he receives \$500,000.

Although the accomplishments for which players are promised bonuses are often similar, the structure and amounts of the bonuses can vary greatly. Agents can be very creative with bonus structure and often utilize bonuses as a bargaining tool to reach a contract that is agreeable to both sides.

Taxation of Professional Athletes

In the realm of state income taxes, professional athletes pay state income tax in their state of residence just like other taxpayers. The state income tax is paid to the state in which the person resides, and the tax rate varies among states. Alaska, Florida, Nevada, South Dakota, Texas, Washington, and Wyoming do not have any state income tax. MLB players almost always fall into the highest bracket for state income tax if they play the entire season at the major league level (as opposed to the minor leagues). It is important to remember that their taxable income includes the annual salary, any portion of the signing bonus that has been allocated throughout the duration of the contract, performance bonuses received, as well as income from endorsements and sponsorships. Income from endorsements and sponsorships can be a significant addition to a player's salary. For most professional athletes, the state of residence is the state in which their

team is located. This makes them an ideal data pool for studies about state income tax effects on taxpayer migration and other behaviors, because the state of residency, and therefore the applicable tax rate, is more certain (Ross & Dunn, 2007).

Additionally, many states also have nonresident income taxation laws requiring any non-resident who earns income in the state to pay income tax on the portion of the income that was earned in that state. For professional athletes, these taxes are significant because they earn a high income and earn a large portion of that income (about half) while playing away games in a state other than that of their residence. Some cities impose these taxes as well. This income tax scheme has come to be known as “jock taxes,” as it appears as though professional athletes are targeted for compliance with this tax more than the general public. Hawkins, Slay, and Wallace (2002) attempted to study this commonly accepted assumption regarding enforcement of non-resident state income tax laws, but were unable to find an answer, as there is little public data available on audits and compliance for specific groups of taxpayers. Jock taxes are especially complicated for MLB players. Each regular season they play 82 games at opponents’ stadiums, most or all of which are located in a different state than that of players’ residences. Many players trust their agents or hire personal accountants to manage these complicated tax laws (Green, 1998).

The non-resident state tax laws arose out of a time when municipal entities were low on cash and looking for additional ways to increase revenues. Philadelphia was the first city to put the non-resident tax structure into practice, passing a statute in the 1930s. Originally tax officials thought that the cost of administration and enforcement would be greater than the revenues generated by the tax, but with time they were proven wrong and

found the program to be very successful. In 1998 at the time of Green's study regarding jock taxes, twenty-four states had at least one professional team, and eighteen of these states imposed a non-resident income tax (Green, 1998).

This interesting nuance of state taxation has been the focus of many scholarly articles. Although Hawkins et al. (2002) were unable to determine whether or not state tax administrations discriminate in enforcement of the non-resident tax laws, they did survey the state tax administrations about many other areas of non-resident taxation. They found that states use various different structures, although the most common method of determining a non-resident's tax liability is the "duty days" method. A player's duty days include all days that the team requires him to practice or play a game. The method assumes the player earns income evenly across all duty days. This method multiplies the player's salary by the proportion of duty days spent in the state to determine the amount of income that is deemed to be earned in that state. This amount is the tax basis for the non-resident state income tax (Hawkins et al., 2002).

Effects of State Taxation on Player Salaries

Three previous studies provide the background for the hypothesis and analysis presented in this paper. Ross and Dunn (2007) examined the state income tax responsiveness of the rich using MLB All-Star free agents as the data pool. Income tax responsiveness refers to how a jurisdiction's income tax rates and structure affect individuals' choices about where to live. They found MLB All-Star free agents to be a useful data pool because the state of residency can be consistently assumed to be the state in which their team is located. For other wealthy individuals, who often own several

personal residences, the state of residency is more difficult to determine. Additionally, the salaries of baseball players are published to the public and easily available. They hypothesize that teams located in states with higher income tax must offer higher salaries in free agency to sign the best players. The results of their analysis demonstrate that for each 1% increase in tax rate of one state over another, the team must pay a 3.3% higher salary.

Ross and Dunn (2007) conclude that when migration between tax jurisdictions is possible, as is the case for a free agent player comparing contract offers between teams, before-tax income will adjust so that after-tax income in the two jurisdictions is equal. This means that the employer bears the tax incidence. The implication for MLB teams is that teams located in higher income tax states may be at a disadvantage in bidding for All-Star free agents. This finding is even more important for professional sports leagues that have a salary cap – the NFL, NBA, and NHL. Teams that have to pay each player more to compensate for high income tax will fill up their salary cap space sooner than those that do not have to compensate for a high tax rate.

Alm, Kaempfer, and Sennoga (2012) conducted a similar study to test their hypothesis that free agent salaries directly correlate with state income tax. The hypothesis was based in the general theory of tax incidence, which holds that the tax incidence will be shifted from mobile factors to fixed factors. In this scenario, the free agent player is the mobile factor and the team is the fixed factor. This means that as a player negotiates a salary offer with a team, he (or his agent) will demand a higher salary from a team in a high tax state to compensate for the state tax, and the team will bear the burden of the tax rate difference between states.

In the analysis they considered several other factors that could affect the amount of the salary offered to a free agent, such as previous performance (both offensive and defensive), age, and position. Their results indicated that for each percentage point of state income tax, a free agent's annual salary increases by \$21,000 to \$24,000, confirming the hypothesis that state income taxes have a significant impact on free agent salaries. Again, the implication for MLB teams is that teams located in states that have a high income tax are paying significantly more for payroll than those located in states with low or no income tax. Alm et al. estimated that teams located in states with no state income tax have a 2% to 3% savings on salary each year, relative to the other clubs. The authors also offered that future research might investigate whether differences in state income tax effects extend to other areas of players' contracts, such as no-trade clauses.

Veloitis (2013) applied the findings of the previous two studies to create equations with differing levels of complexity to be used by players, agents, and teams throughout the negotiation process. These equations consider various player performance factors, as well as the federal and state income tax consequences of the salary. Players and agents can use these different models to compare contract offers at a net-of-tax amount that more directly represents the amount of money that the player takes home. Veloitis considers three areas that his colleagues did not: 1 Deductibility of state income taxes from federal taxable income; 2 Significant income beyond salary (i.e., endorsements); and 3 Games played in Canada.

Veloitis also uses the example of Cliff Lee's free agency before the 2010 season. Texas does not have an income tax, and New York has one of the highest state income tax rates. Veloitis' models show that the Yankees would have had to pay Lee 7.32% more

than the Rangers to make an equal after-tax salary offer. An ESPN article by Beaman (2010), with a very simple analysis, concluded that the \$123 million contract offer from the Rangers would be more valuable to Lee after taxes than the \$140 million offer from the Yankees. A *Wall Street Journal* article also assessed the total value to Lee of each contract offer, but it took into consideration the additional endorsement money that Lee was likely to gain as a Yankee. This article estimated that the Yankees' \$140 million offer would net to about \$83.9 million after taxes, and that the Rangers' \$123 million offer would net to about \$91.2 million. Experts cited that Lee would gain about \$1 - \$2 million more in endorsements in New York than in Texas, but the Texas deal would still offer the most value after tax considerations (Costa, 2010).

Lastly, Veloitis also offers a suggestion to simplify the current system, in which a player must file a return and pay a state income tax in nearly every state the player played in during the season. He presents the possibility of an "ex-post" arrangement between teams and players, similar to the model used by many multinational companies with their ex-patriot executives. In very basic terms, the team calculates all of the taxes the player needs to pay, and gives the player this additional amount to pay the taxes. This would create significantly higher costs for teams, but it would certainly simplify the situation for the players. Teams might find that the players' on-field performance is better as they eliminate another potential off-the-field worry for players.

METHODOLOGY

Data Pool and Descriptive Statistics

The data pool used for this analysis is the 156 highest-paid MLB players in the 2014 season, as ranked by base salary.³ Players' salary data is available to the public, but the information about the bonuses was reported for only 37% of the players. I collected the contract, salary, and bonus data from Sportrac.com and the WAR data from Baseball-Reference.com. I ran two regression analyses: one to examine the relationship between state income tax rates and average salaries, and a second to examine the relationship between state income tax rates and average bonuses.

TABLE 1:
SALARY INFORMATION FOR ALL PLAYERS (N=156)

	N	Mean	Median	Standard Deviation	Maximum	Minimum
Annual salaries	375*	\$13,500,000	\$14,661,505	\$6,114,533	\$30,000,000	\$500,000
Years in free agent contracts	76	3.80	3.00	2.25	10.00	1.00
Free agents**	75	\$13,078,510	\$12,000,000	\$5,228,798	\$24,142,857	\$4,250,000
Non-free agents**	81	\$11,855,710	\$10,350,000	\$4,665,637	\$25,000,000	\$7,000,000
Pitchers**	67	\$11,788,963	\$10,000,000	\$4,817,791	\$24,142,857	\$6,000,000
Non-pitchers**	89	\$12,936,407	\$12,000,000	\$5,045,931	\$25,000,000	\$4,250,000

*Each year of a player's contract counts as 1 salary observation, and most players sign multiple-year contracts.

**Annual salary averaged over the current contract to produce one observation per player.

For the regression analysis regarding the relationship between salary and state income tax rates, the data pool consisted of only the 75 players within the top 156 that

³ The data pool was originally intended to be the top 150 highest-paid players, but 13 players were tied for the 144th spot in the rankings, so I expanded the data set to include all 13.

signed as free agents. Salary data was collected for each year of the contract under which the player was working in 2014. The N=375 line in Table 1 uses each year of each contract as one observation. In the other lines that report salary information, an average of the player's salary over the length of the contract was used to produce one observation per player. It is notable in Table 1 that the mean and median average salaries of players that signed as free agents are about \$1,500,000 greater than the mean and median average salaries of players that did not sign as free agents. This makes sense because players that sign as free agents are able to use one team's offer as leverage in driving up the offer of a second, third, or fourth team that is interested in signing that player. Players that do not sign as free agents are subject to the reserve clause with little to no bargaining power, able to negotiate only with their current team, or have the salary amount decided by an arbitrator. The system is designed to produce the highest average salaries for those who sign as free agents, and the numbers shown in Table 1 validate that.

Table 1 also shows that non-pitchers have a higher average salary than pitchers, but the gap is less significant than the difference between free agents and non-free agents. This could be due simply to the fact that there are 22 more non-pitchers than pitchers.

TABLE 2:
BONUS INFORMATION FOR ALL PLAYERS WITH DATA AVAILABLE

	N	Mean	Median	Standard Deviation	Maximum	Minimum
All players	57	\$189,722	\$97,500	\$220,724	\$1,081,818	\$15,000
Free agents	28	\$289,039	\$212,500	\$269,311	\$1,081,818	\$15,000
Non-free agents	29	\$93,829	\$66,667	\$90,072	\$500,000	\$15,000
Pitchers	21	\$245,312	\$145,000	\$214,201	\$750,000	\$25,000
Non-pitchers	36	\$157,294	\$76,250	\$220,900	\$1,081,818	\$15,000

Bonus information was available for only 57 of the 156 players. All types of bonuses and the amounts offered to a player were recorded and then averaged, and this average bonus amount was used in the regression analysis. It is worth noting that, similar to salaries, the mean and median average bonus amounts are significantly higher for players that signed as free agents than those who did not sign as free agents. Again, this is likely due to the fact that the player has more leverage to negotiate his contract.

Performance bonuses provide more benefit to the player than the team. Although the money associated with a specific achievement can be motivational, this number is small in comparison to the salary the player is guaranteed. That is to say, it is unlikely that the bonus money motivation is the reason a player achieves a specific performance level. He probably would have achieved that level without the bonus written into the contract. The team gets the same value out of the player whether or not the bonus is included in the contract, but if the bonus is included, then they have to pay the player an additional amount for this level of achievement. Bonuses primarily benefit the player, and for this reason they are most commonly included and have higher amounts in contracts on which the player had at least some ability to negotiate with the team.

In all situations depicted in Table 2, there is a wide gap between minimum and maximum average bonus. This is likely because the bonuses can be structured in any way that the team and player agree upon – there is no standard or consistent method. There are achievements for which bonuses are more commonly awarded, such as those explained previously, but contracts vary significantly in the amount of money awarded to players for achieving those same levels of performance.

Table 2 also shows the comparison for pitchers and non-pitchers, in which it appears that the pitchers have higher average bonuses in their contracts, even with 15 fewer pitchers in the data set than non-pitchers. There does not appear to be a logical or systematic reason for this. It might be due to the small sample size, and with a bigger data set there might not be a significant difference between bonuses for pitchers and non-pitchers.

Table 3 lists the states with MLB teams, the highest marginal state tax rate for the earliest season in which a new contract began (2009)⁴, and for the most recent season in which a new contract began (2014), the number of teams each state hosts, and the number of players from the data set that play on each team.

TABLE 3:
STATE INCOME TAX RATES

State	2009 Tax Rate	2014 Tax Rate	Team(s)	Players
Arizona	4.54%	4.54%	Diamondbacks	6
California	10.55%	13.30%	Angels	7
			Athletics	2
			Dodgers	10
			Giants	7
			Padres	2
Colorado	4.63%	4.63%	Rockies	5
District of Columbia	8.50%	8.95%	Nationals	7
Florida	0.00%	0.00%	Marlins	2
			Rays	2
Georgia	6.00%	6.00%	Braves	4
Illinois	3.00%	5.00%	Cubs	1
			White Sox	3
Maryland	6.25%	5.75%	Orioles	7

⁴ For the players included in the salary regression data set, the earliest season in which a current contract began was 2010. For the players included in the bonus regression data set, the earliest season in which a current contract began was 2009.

Massachusetts	5.30%	5.20%	Red Sox	7
Michigan	4.35%	4.25%	Tigers	10
Minnesota	7.85%	9.85%	Twins	4
Missouri	6.00%	6.00%	Royals	5
			Cardinals	7
New York	8.97%	8.82%	Mets	4
			Yankees	9
Ohio	5.93%	5.40%	Indians	2
			Reds	7
Ontario	12.16%*	13.16%	Blue Jays	6
Pennsylvania	3.07%	3.07%	Phillies	11
			Pirates	2
Texas	0.00%	0.00%	Astros	2
			Rangers	5
Washington	0.00%	0.00%	Mariners	3
Wisconsin	7.75%	7.65%	Brewers	7

*2012 rate because 2009 rate was unavailable

Analysis and Results

Regression Models

In the analysis of salaries, the data set was the 75 players of the 156 that signed their current contract as free agents, with the intention of capturing the free market nature of free agent negotiations. The model used for the salary regression is

$$\text{Salary}_{it} = a_1 * T_{it} + a_2 * P_i + a_3 * \text{WAR}_{it} + a_4 * \text{WAR}_{it-1} + a_5 * \text{WAR}_{it-2} + a_6 * \text{YR2010} + a_7 * \text{YR2011} + a_8 * \text{YR2012} + a_9 * \text{YR2013} + a_{10} * \text{YR2014},$$

where Salary_{it} = average annual salary for player i in contract with first season t ,

i = player

t = first season in current contract

T_{it} = highest marginal state tax rate for year t in the state in which player i 's team is located

$P_i = 0/1$ variable indicating if player i is a pitcher or non-pitcher

WAR_{it} = the WAR of player i in season t

WAR_{it-1} = WAR of player i in the season prior to season t

WAR_{it-2} = WAR of player i in the season two seasons prior to season t

$YR_{2010}, YR_{2011}, YR_{2012}, YR_{2013}, YR_{2014}$ = dummy variable for each year.

I used the log of the mean salary to normalize the salary data, as the difference between the highest salary observation and the lowest salary observation was substantial. A 2-sided p -value less than 0.10 indicates significance for any variable in the model, and significance of the T_{it} variable would support my hypothesis that salaries are greater for players on teams in higher tax states.

The other variables included in the regression are intended to control for other factors that contribute to the amount of the salary. In practical terms, these are the factors that teams consider when developing an offer for a player.

Three years of WAR data are included in the regression analysis, each as a distinct variable. These variables account for a team's consideration of player performance, quality, and anticipated added value to the team. For one player WAR_{it} could be for the 2013 season and for another it could be for the 2011 season. If WAR_{it} is for the 2013 season, WAR_{it-1} is for 2012, and WAR_{it-2} is for 2011. I presume that teams would only strongly consider a player's performance for the most recent years. The player, the teams, and the league can change significantly in just a few years. For this reason I did not include WAR for further back than two seasons. The data in Panel A of

Table 4 was used in the salary regression. The data in Panel B was used in the bonus regression.

TABLE 4:
WINS ABOVE REPLACEMENT (WAR)

PANEL A: FREE AGENTS

	N	Mean	Median	Standard Deviation	Maximum	Minimum
Year 0	75	2.28	1.70	2.23	8.60	-1.30
Year -1	73	2.88	2.65	1.82	7.80	-0.70
Year -2	72	2.43	2.05	1.98	8.40	-1.30

PANEL B: ALL PLAYERS WITH BONUS DATA

	N	Mean	Median	Standard Deviation	Maximum	Minimum
Year 0	57	3.26	2.80	2.57	9.70	-2.30
Year -1	54	3.34	3.40	2.23	8.40	-0.60
Year -2	53	4.05	4.00	2.32	7.80	-0.70

The sample size for the bonus regression included all of the 156 players for which data was available, which is 57. The model I used for the bonus regression is similar to that of salaries:

$$\text{Bonus}_{it} = b_1 * T_{it} + b_2 * P_i + b_3 * \text{WAR}_{0it} + b_4 * \text{WAR}_{it-1} + b_5 * \text{WAR}_{it-2},$$

where Bonus_{it} = average bonus for player i in contract with first season t ,

i = player

t = first season in current contract

T_{it} = highest marginal state tax rate for year t in the state in which player i 's team is located

P_i = 0/1 variable indicating if player i is a pitcher or non-pitcher

WAR_{it} = the WAR of player i in season t

WAR_{it-1} = WAR of player i in the season prior to season t

WAR_{it-2} = WAR of player i in the season two seasons prior to season t .

I excluded the dummy variable for the first year in the contract due to the smaller sample size of this analysis. The variable-observation ratio would have been too high to include the dummy variables for all six years.

Results and Conclusions

The results of my regression analysis for salaries showed significance for the variables T_{it} , WAR_{it} , and WAR_{it-1} . The results of the bonus regression analysis did not show significance for any variables. A possible explanation is that the data set was too small or that there is not any relationship at all. Bonuses could simply be a final negotiating tool used by agents and teams to reach agreement on a player's contract.

TABLE 5:
REGRESSION RESULTS

Variable	Salary Regression		Bonus Regression	
	Coefficient Value	p-value	Coefficient Value	p-value
T_{it}	1.74675	0.0999	2.01068	0.5660
P_i	0.08891	0.2707	0.28021	0.3721
WAR_{it}	0.05205	0.0072	-0.02677	0.6910
WAR_{it-1}	0.10592	<0.0001	-0.08072	0.2816
WAR_{it-2}	0.02198	0.2924	0.01532	0.8262
YR2010	-0.10667	0.7787		
YR2011	-0.15043	0.5577		
YR2012	-0.21061	0.3964		
YR2013	-0.35102	0.1491		
YR2014	-0.23654	0.3284		

The significance of the T_{it} variable supports my hypothesis and indicates that as the state income tax increases, the player's average salary over the contract increases. These results are consistent with that of previous studies, as this relationship would demonstrate that teams take on at least a portion of the tax burden. These results are also consistent with tax theory overall – the tax burden is shifted from the mobile factor to the

fixed factor, as the mobile factor can choose its tax jurisdiction and the fixed factor cannot (Alm et al., 2012). This then leads us to believe that teams located in states with high income tax are at a disadvantage when bidding for free agents against teams in low or no income tax states. The player and his agent compare after-tax salaries. Thus, for a team to offer a player a competitive salary, teams in high-tax states have to pay more to compensate the player for his additional state tax liability.

The significance of WAR_{it} is compelling. The results suggest that players with a higher performance in the first year of the new contract have a higher average annual salary. This indicates that teams are getting it right – they are paying the most money to players with the best performance. It could also be that a player under a new contract with a large salary feels a need to prove to the team, owners, and fans that he is worth the large amount of money he is paid. It is also a commonly held belief throughout professional sports that players have huge incentives to play their best in the last year of the old contract, as a better performance in this year will lead to higher free agent salary offers. The strong significance of WAR_{it-1} in the model validates this assumption.

Previous studies used traditional player performance statistics in the regression models, but I used WAR, a contemporary baseball metric. My results were consistent with previous studies, and I believe this provides credibility to the use of sabermetrics in future scholarly research. The consistency of the results indicates that WAR quantifies player value just as well as a combination of numerous traditional statistics does. This also legitimizes WAR for use by teams and agents as they evaluate and compare players and salaries.

Limitations and Future Research

The most significant limitation to my study was the lack of availability of data regarding player bonuses. If more of this information was published or if a researcher used an expanded data set, it would be interesting to analyze bonuses again to see if the larger data set would produce any significant results regarding a relationship to state income taxes.

Another area of contract negotiations that I was interested in studying at the outset of my research was no-trade clauses. Alm et al. (2012) suggested a study of this type in their research, but there is still not enough data available to have enough observations to produce a regression analysis. The thought behind this is that if players take income tax implications seriously when considering their contracts, they may include teams located in high-tax states more commonly in the no-trade clause than teams located in low or no tax states. If this data was to become available, a study of this type would provide further evidence on the advantages and disadvantages that teams have in signing top-talent free agents based on their state's income tax.

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