America’s Pastime: Statistics Contracts, Player Performance and Value

**Introduction**

Baseball, a sport where statistics are king and determine the success and impact of a player in the league. Based on said statistics fans have for many years argued about the best batter player in said sport.  By comparing offensive productivity (stats produced by a batter) sport broadcasters have made different lists of the all-time greats. Stats not only give an argument for the best offensive statistics, they reward a player with new contract extensions. If a player has a good offensive producing season (high Avg., RBI and HR totals), he will attract the attention of the other teams in the league. In order to fend them off, the team for which the batter currently plays for offer them a contract extension worth large amounts of money. The thing in baseball is that all the money is guaranteed, meaning that when the players sign the deal the team is compromised to pay the settled amount completely. To be able to pay these large amounts of money teams offer multiyear deals and break down the salary of the player over the term of the deal paying each year a settled amount of money. The most recent of these deals is the $325 million 13-year deal that the Miami Marlins agreed on with outfielder Giancarlo Stanton; the biggest deal in sports history. In recent years, these types of contracts are on the rise. In some cases, the most famous being that of 3B Alex Rodriguez, a large contract sees a decline in player performance. Sturman and Thibodeau (2001) linked contract length with performance. Krautmann and Oppenheimer (2002) linked contract length and valuation. Using these two previous studies Cahill (2014) concluded that once a player has signed a long-term deal worth a large amount of money his offensive performance, in terms of stats like Avg. RBI and HR, decreases through the duration of the deal. As more long term deals are on the rise, more teams are prone to lose the performance levels of their star players. The focus of this research is to create a contract structure that fits both the needs of the team and the player and that attempts to prevent the downfall of offensive production that is an increasing problem among clubhouses around the MLB as more players are signing greater deals. The aim of the created contract structure is to offer a possible solution to MLB franchises and their players.

**Literature Review**

**Introduction**

Baseball has been studied closely since the signing of the Basic Agreement in 1976. This allowed players to become free agents and negotiate their new contracts with many teams. Better offensive performances, that brought in better stats attracted teams who offered large deals in terms of money, to convince the player, and length in order to keep the player and what he gives off to the team for a good amount of time. Contracts, player performance and their intricate relationship, have been looked at by other researchers.

**Offensive Production and Statistics**

Throughout the history of the sport, many models or statistics have been created to show the offensive performance of players.  The three most common statistics used to measure offensive production are Batting Average (BA) or simply the rate at which a player produces hits, Runs Batted In (RBI) and Homeruns (HR) (MLB). These are the most used and most common but, these are not quite the best to measure player performance. Bennet and Flueck (1983) studied all the offensive estimators that have been created to measure hitter’s performance. The most complete stat, acknowledged by the MLB, is the sabermetric Wins Above Replacement (WAR) which measures the overall wins added by a player to his team over a replacement player. In the study, WAR was highly criticized as at that time as there was no standard version of it as there were three existing versions. In 2015, *Fangraphs* and *Baseball-Reference.com* came together and created a standardized WAR out of the three existing versions making WAR the most complete statistic in existence. Ultimately, stats rule baseball and will in the end, decide the contracts that players receive.

**Contract Length and Player Performance**

Previous research using various methodologies, indicated a significant relationship between contract length and player performance. Meltzer (2005), investigated how variations in player performance and other factors such as injuries and off-field incidents have an impact on the contract value and most importantly, length of a player. By analyzing data from the 2002 season, Meltzer concluded that young players get long term, low money deals in order to encourage them to improve their performance. Injury prone players and veterans, are given short contracts with a salary that teams think is adequate for the risks of their lagging performance. Adding on to Meltzer’s idea, Stankiewicz (2009) explored in more detail the actual relationship between contract length and player performance. She studied contract by contract based on player opinion and found out that MLB players prefer a long term contract as there is a guaranteed income over a long period of time. She then backs this up with the finding that a multi-year deal is better than a one-year deal as it increases player performance. Seemingly, players back up that argument for long term deals by outputting a greater offensive production in the long run for the team. Stankiewicz suggests further research as her findings were done on only some players in a very general scope. Other studies also focusing length and performance contradict Stankiewicz’ conclusion that multi-year deals in the end give out a higher offensive production for the team. Cahill (2014) and Sturman and Thibodeau (2001), both concluded that players tended to decline in performance once they signed a long-term deal. This conclusion is worrying for the MLB as longer and larger contracts are on the rise. (Perry 2014). A meta-analysis with data of the last 120 years by Judge et. al on pay and job satisfaction, (2010) concluded that less than 2% of people are actually motivated by their salaries, and they also did not relate their performance and/or job satisfaction to the increase of their salaries. This shows that higher salaries in any field, will have no positive effect on performance, this trend is also apparently true in baseball in accordance to Cahill´s (2014) and Sturman and Thibodeau’s (2001) research.

**Contract Length and Valuation**

Research has also established a relationship between the length and valuation of a contract. Krautmann and Oppenheimer (2002) were the first to link contract length with valuation. Their research concluded that there is a positive correlation between length and value. It was also concluded that with any contract, the player will take time to produce the stats that the team desires. Stankiewicz (2009) bases of her conclusion of a multi- year deal being better than a one-year deal on Krautmann and Oppenheimer’s conclusion by arguing that a one-year deal will bring low stats as opposed to a multi-year deal which in the end, will bring better stats. Meltzer (2005) studied Krautmann and Oppenheimer’s results and concluded that there are two areas of divergence or “exemption of the rule” in terms of contract length and valuation. These are with rookies and injury prone players. Rookies will receive long contracts with a low salary and injury prone players will receive short-term deals with a medium or moderate salary. Averbukh (2015) looked at Meltzer’s results and attempted to create a contract structure that would assure a good balance between length, valuation, and performance for pitchers including rookies and injury prone players. In his conclusion it is stated that no contract could be created as he failed to consider factors like taxes and team payrolls. The only conclusion reached is that a team must look for the greatest performance at the lowest cost possible. In previous research, it had been concluded that one had to consider team payrolls as in recent years there has been a polarization or imbalance between team payrolls of over $200 million in the MLB. Team payrolls greatly affect contract value and determine the biggest earners in the big leagues.

**Biggest Earners**

As the sport has grown over the years, markets have increased, and inflation has shifted the largest salaries in baseball have drastically increased over the years. Using their lifetime statistics, Pantucoso and Stone (2010), found that players that have been inducted into the hall of fame (HOF) would earn an average of 20 million dollars (2009 dollars) per year. They also explain that today’s players get contracts based on their performance of their last four seasons, not their lifetime statistics. Many players who have not had HOF worthy careers are earning more per year than some of the best players in the history of the sport. In order to look deeper into current salaries one must go into team payrolls. According to Brandenhausen (2016) The two biggest payrolls in the MLB belong to the Los Angeles Dodgers and the New York Yankees. In 2016 the Dodgers will give out a total of $267,302,820, the Yankees a total of $226,615,376. The team that will give out the least amount of money are the Tampa Bay Rays with a total of $67,538,625. There is a difference of almost $200 million, this confirms Staudohar’s idea of payroll polarization. Payroll polarization has a big effect on a team’s regular season performance. Schwartz and Zarrow (2009) explored the relationship between payroll of MLB teams and their success in regular season and postseason. It was concluded that the bigger the payroll the more wins a team will typically have in a season. They recommend teams to follow what Averbukh concluded: find great productivity at a low cost.

**Contract Structure**

In baseball, two types of contracts exist. The signing of free agents and the contract extensions of players on team rosters. The average length of the contract signed of a free agent is 1.79 years or 2 seasons. The average contract extension is of 4 years (Meltzer, 2005) Contract structures have changed throughout the years. These numbers, which are the most recent, changed in the 1990s when contract regulations were changed by The Major League Baseball Player Association (MLBPA). After the player strike of 1994-1995 Major League Baseball (MLB) teams started resigning free agents and new deal structures were created under the basis of demands set by the MLBPA. (Staudohar, 1997) With this structure in place a new minimum salary was established at $300,000. Staudohar (1997) also found that since the 1970’s the minimum salaries of MLB players has seen a sharp increase of over 10-17% per year. This would mean that the minimum salary of 2016 would be much different to that of 2003 if this trend is still occurring. The minimum salary and contract regulations are designated by the MLBPA and the MLB in their 4-year Collective Bargaining Agreement (CBA). Not only do MLBPA regulations apply, also federal laws like taxes apply. Alm and Kaempfer (2012) found that teams with lower income taxes in their cities will be able to easily sign a free agent as their salary will be much lower. The lower the salary, there will be no risk of luxury tax, and teams will save money while getting more players and thus more productivity.

**Conclusion**

With longer and larger contracts on the rise, more players, possibly superstars, could fall into a lack of performance according to Cahill’s and Sturman and Thibodeau’s conclusions. This could end up being a big problem for the MLB with less action for the fans to see. In her conclusions, Stankiewicz suggested to do further research for only one player and Averbukh could not create a contract structure because it was too generalized for too many players and important aspects as taxes and team payrolls were not considered. In the field of research, no case study on one single player and generating his contract for better production has been made. Based on previous recommendations and gaps of other researchers an attempt will be made to determine a contract structure for one player, that fits both its team and the player, that improves his performance over the years. This could possibly bring in a new horizon for MLB contracts.

**Methodology\***

I decided to limit my research to hitters. Mainly it will be collection of data and analysis of it. For the step of creating the contract it is a kind of case study on the player. Last step on predicting future stats it is a kind of Delphi research, and the case study continues into the future.

1. Determine the qualified players of the last 4 seasons (must be active in all 4)
2. Data from the websites mentioned will be gathered to collect WAR statistics for each player
3. Calculate Avg. WAR for each player.
4. This will determine the most productive hitter.
5. Collect data for all team payrolls
6. Analyze each contract structure of the qualified players to see which deals brought in the most productivity (will be determined in hits (H) homeruns (HR) and Runs Batted In (RBI)) and which are the most common.
   1. Contracts will be divided in different groups:
      1. Most common for a hitter in length, average player production under said deal
      2. Most common for a hitter in value, average production under said deal
      3. Most common for each position in the field (9 positions total) in terms of length and value, average player production under said deal.
      4. Most common for rookies and veterans in terms of length and value, average player production under said deal
7. Depending on who the most productive player is (team, position and player status) a contract structure will be made.
8. It will make reference to the analysis of contracts, the ideas presented by the sources in the introduction, MLB ‘s minimum wage and structures of MLB and Japanese baseball as well as other sports.

With this new contract, and based on his previous stats, predict his future statistics.

Variable Definitions: provided by *MLB.com*

|  |  |
| --- | --- |
| Variable | Definition |
| Status | Player status either a rookie (R) which means he has been only the minimum four years in the league or a Veteran (V) four years plus. |
| CL | Contract Length, how much a contract lasts, it is measured in years |
| CV | Contract Value, how much the contract is worth measured in millions of USD |
| H | Hits, the number of times a player hits the ball and reaches base safely without aid of an error or fielder’s choice. |
| HR | Home Run: the number of times a player hits the ball and reaches home plate safely without the aid of an error |
| RBI | Runs Batted In: Number of runs that score safely due to a player hitting the ball or drawing a walk. |

**Results**

To determine who has been the most productive hitter in the MLB in the past four seasons the WAR sabermetric was used.

WAR Results:

Mike Trout had the Highest average WAR in the past four seasons (9.26), he led the league in WAR in three of those four, meaning that the discussion will focus on how a contract will apply to Mike Trout considering his position as a Central Fielder and experience as a Rookie for this study as well as the Payroll that the Los Angeles Angels have available, the team that he currently plays for.

Team Payrolls:

For the 2016 season the Los Angeles Angels had a total payroll of $180,743,007 in 2016. In 2017 it is expected for them to have a total payroll of $150,318,333,which out of that 19,250,000 are spent on Trout’s Salary (Sportrac). The contract created will aim to follow the idea of getting the most productivity at a lower cost, so the contract in the in the end will try to reduce their total payroll from 150,318,333 to something lower by reducing Trout’s salary which represents 12.8% of the Angels’ payroll, if this is achieved, then the Angels will have more space to possibly sign other players that add to the team’s productivity.

An analysis of the different contracts in the MLB was done in order to establish the best possible contract in terms of highest productivity and lowest cost. As Trout is a Center Fielder and a Rookie for this study, he will be compared to other Center Fielders and Rookies in the league. Contract Structures will also be broken down to see which length brings in the most productivity for all Center Fielders and Rookies in the league.

Model A: Productivity and Contract Value of Center Fielders regarding contract length.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| CL | CV | H | HR | RBI |
| 1 | 3.7 | 147.3 | 18.8 | 65.5 |
| 2-4 | 31 (10.3 per year) | 152 | 11 | 53 |
| 5-7 | 108.6 (about 18.1 per year) | 163.6 | 24.9 | 83.3 |
| 8-10+  No CF with this CL. | N/A | N/A | N/A | N/A |

Model B: Productivity and Contract Value of Rookies regarding contract length.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| CL | CV | H | HR | RBI |
| 1 | 2.1 | 151.5 | 21.1 | 74 |
| 2-4 | 27.7 (about 9.2 per year) | 155.3 | 25.5 | 81.2 |
| 5-7 | 65.5 (about 10.9 per year) | 159 | 20.3 | 77 |
| 8-10+  No R with this CL | N/A | N/A | N/A | N/A |

Model C: Average productivity and contract value for players who are Rookies and Center Fielders (excluding Trout; The 5 players that fall into the criteria have a one-year contract.) regarding contract length

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| CL | CV | H | HR | RBI |
| 1 | 1.9 | 151.6 | 25 | 69 |

Model D: Mike Trout’s stat line during the past four seasons was:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| CL | CV | H | HR | RBI |
| 6 | 144.5 (24.1 per year, 19.25 in 2016-2017) | 172.7 | 35.3 | 100.3 |

**Discussion**