Expectancy theory and major league baseball player compensation

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EXPECTANCY THEORY AND MAJOR LEAGUE BASEBALL PLAYER COMPENSATION

by

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Abstract

Major League Baseball (MLB) organizations spend millions of dollars each year on athletes with the end goal of winning a World Series title. However when an organization signs a player to a long term contract are they actually receiving the production that they paid for? Under the MLB's current form of player compensation players may not be properly motivated or at least not motivated to perform at their highest level.

The intent of this thesis was to apply expectancy theory in assessing Major League Baseball's current form of player compensation. It evaluates how well players are currently motivated to perform on the field, and if any improvements can be made. This is done through the statistical analysis of MLB organizations yearly salary data, yearly win-loss record, and the performance of 65 players two years prior to, one year prior to, and during their first contract term directly following or extending past arbitration eligibility. Evidence shows that player motivation, especially for position players, can be increased and several suggestions are made as to how this can be improved and how MLB organizations can increase the odds of player production matching compensation.

To all baseball personnel and enthusiasts who would like to see Major League Baseball players play to their highest potential every time they step out onto the field.

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Definition of Terms

BA= Batting Average= Hits/ At Bats

SLG= Slugging Percentage= (1B + 2*2B + 3*3B + 4*HR) / At Bats

OBP= On-Base Percentage= (Hits + Walks + Hit By Pitch) / (At Bats + Walks + Hit By Pitch + Sacrifice Fly)

FPCT= Fielding Percentage= (Putouts + Assists) / (Putouts + Assists + Errors)

WAR= Wins Above Replacement= Represents the number of wins a player adds to their team above what a replacement player would add

ERA= Earned Run Average= (9 * Earned Runs) / Innings Pitched

K/9= Strikeouts Per Nine Innings Pitched= (9 * Strikeouts) / Innings Pitched

WHIP= Walks and Hits Per Innings Pitched= (Walks + Hits) / Innings Pitched

Table of Contents

Introduction

Since the creation of free agency in 1976 player salaries in Major League Baseball (MLB) have increased immensely. The average MLB salary in 1976 was $51,501 (Holtzman, 2012) and grew to $3,440,000 in 2012 (MLB Salaries). That's an astronomical 6,679% increase. Due to the large amount of money involved in player contracts today, it has become more important than ever for teams to get production out of their highly paid athletes. This brings about the question of whether or not MLB organizations actually get what they pay for when signing a free-agent player to a long term contract. David Ahlstrom, et. al (1999, pg 181) suggests that "if Major League Baseball teams pay free agents based on free-agent-year performance, they might not be satisfied with the result." This may be due to the fact that under Major League Baseball's current form of player compensation players are not properly motivated.

This study will apply expectancy theory in assessing Major League Baseball's current form of player compensation. It will evaluate how well players are currently motivated to perform on the field and if any improvements can be made. Previous studies in the area of expectancy theory and MLB player compensation have focused on "non-pitchers" (Ahlstrom, et. al, 1999; Duchon and Jago, 1981; Martin, et. al, 2011) or position players. This prevents the researchers from getting a full view of MLB player compensation as they are left without data from about 1/3 of the player pool. This study will analyze both position players and starting pitchers, using a set of statistical categories including wins above replacement (WAR) to compare the two. In order to better evaluate how player's performance and motivation are

affected by long term contracts, player performance will be measured using the season two years prior to the new contract, the season prior to the new contract, the first, middle, and last season of their first contract that starts the year following or extends past their arbitration eligibility (given that the contract is three years or longer), and career averages. This builds upon the research of Ahlstrom, et. al, (1999), Martin, et. al, (2011), who evaluated performance of all position players during the year prior to free-agency, year of free-agency, and year following free-agency. By exploring player performance throughout their first contract extending past arbitration eligibility this will enable one to see how performance and motivation differ during the first, middle, and last year(s) of a contract. Previous studies (Ahlstrom, et. al 1999; Martin, et al, 2011) were able to make conclusions on a player's motivation to perform when signing a long-term contract but not on how their performance and motivation differ throughout the term of that contract.

Motivation in Sports

For years scholars have been trying to figure out what motivates a player (regardless of sport) to perform. As a result, a great deal of research has been done on the topic of motivation in sports. Prior research attempting to compare the link between pay and performance has focused on the process theories of motivation. These theories include equity theory (Adams, 1963, 1965) and expectancy theory (Porter and Lawler, 1968; Vroom, 1964). However none have examined player motivation using only expectancy theory. Instead the large majority of scholars have used equity theory or a combination of equity theory and expectancy theory to evaluate player motivation. Originally player motivation in the MLB was measured using only equity theory, but through extensive research on the topic, researchers have found that expectancy theory has a stronger link to motivation and player performance in the MLB than equity theory.

Equity Theory

The theory is based on the comparison of perceived inputs and outputs. Inequity is perceived to exist when a person believes that the ratio of his or her outcomes (pay) to inputs (performance) differs from the ratio of a referent other's outcomes to inputs (Adams, 1965). A "referent other" could include a co-worker (teammate) or some other peer (player on different team). Adams (1965) summarized his theory to show that an individual goes through the following train of thought: 1) An individual perceives inequity, which creates tension. 2) This tension is directly proportional to the magnitude of the inequity. 3) The strength of the individual's motivation to reduce the inequity is proportional to the magnitude of the inequity. Put differently, when individuals feel as though they are being treated unfairly (under-paid) in

comparison to their peers they will attempt to restore a balance between their inputs and outcomes and the inputs and outcomes of a referent other. Adams (1965) hypothesized a set of responses that individuals engage in to restore equity. These include: 1) changing one's own inputs or outcomes; 2) changing the inputs or outcomes of the referent other; 3) cognitively distorting the inputs or outcomes; 4) changing the referent other; or 5) leaving the situation.

Equity Theory in Major League Baseball

The first study to test motivation of MLB players using equity theory was conducted by Lord and Hohenfeld (1979). Their sample consisted of 23 position players in the MLB who chose to play out their options by not signing a contract before the start of the 1977 season. Of this sample, 10 signed during the 1976 season and 13 played the entire season without a contract and participated in the free-agent draft after the 1976 season. These players were referred to as "signers" and "non-signers." The performance data of these players as well as their teammates were compiled for the seasons between 1973 and 1977. They found that the performance of both signers and non-signers declined in 1976 as compared to their performance in 1975 and then increased in 1977. These results were believed to be caused by the player's feelings of inequity in 1976 caused by their underpayment relative to other players. The increase in performance in 1977 was a result of the players receiving new contracts with higher salaries. Lord and Hohenfeld concluded that these findings provided support for equity theory.

Robert Lord conducted another study using equity theory to examine the motivation of MLB players in 1989, this time with Neil Hauenstein. The study specifically tested "the effects of final-offer arbitration on the performance of Major League Baseball players" (Hauenstein and

Lord, 1989 pg. 147). In order to test this, Hauenstein and Lord used a sample of 88 MLB players (40 pitchers and 48 nonpitchers) who had a salary dispute settled by final-offer arbitration between the years of 1978 and 1984. The offensive performance data of these players were gathered at three separate points; 1) career average up to but not including the season prior to arbitration, 2) average performance in the season prior to arbitration, and 3) average performance during the postarbitration season. Other relevant player data included the age of the player and his years of experience in the major leagues at the time of arbitration. They found that "arbitration losers showed greater performance decrements relative to arbitration winners" (Hauenstein and Lord, 1989 pg. 158). This meant that those who received less money than they had expected through salary arbitration performed at a lower level than those who received more than expected. Hauenstein and Lord also concluded that the change in postarbitration performance was related to the magnitude of the discrepancy between monetary figures.

Expectancy Theory

According to Vroom (1964), motivation is a factor of an individual's expectancy, instrumentality, and valence. Where expectancy is a person's perception of his or her ability to accomplish an objective, instrumentality is a person's perception of whether or not they will be rewarded for accomplishing that objective and valence is the value a person places on the outcome or reward. In general, the higher one's expectancy or value of the outcome or reward, and the stronger the link between the outcome and reward, the better the chance of motivation. Stated differently, one's effort to perform is a variable measured by one's ability (or perceived ability) to complete a task (expectancy), the idea one will receive a reward upon completion of

the task (instrumentality), and the value the person places on this reward (valence). “Expectancy theory assumes that people have well-defined preferences among various outcomes (rewards) of their actions, and they will adjust their efforts based on those expected outcomes” (Ahlstrom et. al, 1999, pg. 185). Vroom (1964) argued that a clear and strong link between pay and performance will aid in leading to increased motivation. This link between pay and performance is known as instrumentality. If there is a strong link between pay and performance, for example a factory worker who is paid based on how many widgets he creates, then there is said to be high instrumentality. According to Vroom (1964) that worker will be motivated to create as many widgets as possible since it will lead to an increase in pay, given that pay is important to the individual (valence). The effects of instrumentality were evaluated by Georgopoulos et. al (1957) in a study of a unionized appliance factory. The study found that workers who reported high pay-performance outcome instrumentality tended to be higher producers than those who didn’t. Similar results were obtained in a study by Jorgenson et. al (1973), in which they manipulated performance-outcome instrumentality by paying employees in a temporary organization on either an hourly basis (represented low instrumentality) or on a piece-rate basis (high instrumentality). They found that the high-instrumentality group performed better than the low-instrumentality group. To ensure that this was not a result of the members in each group, the groups were asked to switch places. The same results were obtained; the high-instrumentality group exceeded the low-instrumentality group in output and also exceeded its own previous performance under low-instrumentality conditions. Both studies provide evidence that high-instrumentality leads to higher motivation and therefore higher performance. However, there have been some criticisms of Vroom’s model based on its simplicity. In particular Porter and Lawler (1968) assert that

Vroom's model does not take into consideration a person's own traits and abilities and role perceptions when assessing the link between effort and performance. Lawler and Jenkins (1992) explain that expectancy theory can be deceptively simple, in the sense that it can lead you to believe that all an organization needs to do in order to increase productivity is relate a reward to an obtainable level of performance. However, this is only true if the individual places a high value (valence) on the reward. The main difficulty associated with using expectancy theory to assess motivation is determining an individual's valence. This is because everyone's valence of a reward is different. It is a function of an individual's needs, wants, goals, and values.

Expectancy Theory in Major League Baseball

The first to test expectancy theory's principles to evaluate the motivation of MLB players were Duchon and Jago (1981). They had initially set out to extend the research of Lord and Hohenfeld (1979), testing all non-pitchers (30 players in all) in the first three years of baseball's free-agency system. However, their results contradicted equity theory's predictions in that player performance increased for those in their free-agent year in 1977 and 1978. Consequently, they decided to recast the results using expectancy theory. They concluded that the effects of equity theory had only been important in the first year of the new free agency system, when players were not sure what sort of contracts they would receive. However once the pay-performance link had been well established, expectancy effects became increasingly important, suggesting that players would strive to improve their bargaining positions in their free-agent year. These findings are crucial because they imply that expectancy theory is more heavily tied to player motivation in the context of MLB than equity theory.

Harder (1992) also studied equity and expectancy theories' effects in MLB. His study included all MLB players from 1976 to 1988. Both of Harder's hypotheses were related to equity theory. However, some of his findings can be related to expectancy theory. The relevant findings include "career runs created and career runs created per season were significant positive predictors of logged salaries each year, which shows that major-league baseball is a pay-for-performance context" (Harder, 1992, pg. 326). He also found that "Being eligible for free agency the following season had a significant negative effect on runs created in 1987 and 1988, counter to what expectancy theory predicts" (Harder, 1992, pg. 330). This finding is contradictory to those of others (Ahstrom et. al, 1999; Duchon and Jago,1981; Martin et. al, 2011) and to the basis of expectancy theory since according to the theory one would predict that players would perform at a higher level the year before being eligible for free-agency in order to increase their chances of signing a large contract (in terms of monetary compensation).

Possibly the largest study of expectancy theory in the context of MLB player motivation was conducted by Ahlstrom et. al (1999). They too used both equity theory and expectancy theory, but were the first to test hypotheses directly related to expectancy theory. The sample for the study consisted of nonpitcher MLB free agents from 1976 to 1992 who signed contracts with new teams, 172 in all. The study compared player performance during; 1) free-agent year vs. previous year's performance, 2) free-agent year vs. career average, 3) 1st year of new contract vs. free-agent year, and 4) 1st year of new contract vs. career average. In relation to these comparisons they formed four hypotheses with respect to equity theory and expectancy theory; 1) Player performance will be higher in the free-agent year than in previous years, 2) A player's

performance will be higher in his free-agent year than his career average, 3) Player performance will be lower in the 1st year of the new contract than in the previous free-agent year, and 4) A player's performance will be lower in the 1st year of his new contract than his career average. The results of the study gave some support to hypotheses 3 and 4 in relation to expectancy theory, showing that batting performance does indeed decline during the 1st year of a new contract. The results of this study have major implications for MLB contracts as it suggests that "guaranteed contracts harm player motivation, ostensibly by weakening the link between pay and performance, and particularly in the 1st year or two of a contract" (Ahlstrom et al., 1999 pg. 191).

A study conducted by Martin et. al (2011) provides further support for the findings of Ahlstrom et. al (1999) that guaranteed long-term contracts harm player motivation. Their study consisted of the MLB free-agent classes from 1996 to 2008 who fit the following criteria; 1) The player signed a multi-year contract as a free agent with a MLB team, 2) the players primary position is not pitcher, 3) the player must have made at least 250 plate appearances in the season before his contract year, his contract year, and the first year of his new deal. Of the 293 players who fit the criteria, 160 were randomly selected to participate. "A comparison of the mean statistics also showed a sharp decline in performance in the year following the signing of a new contract. Postcontract-year performance dipped below precontract-year output. The tests found that this was a statistically significant drop in player performance in each instance" (Martin et al., 2011, pg. 21).

MLB Player Measurement and Compensation

Major League Baseball organizations spend a great deal of time, effort, and money determining a player's monetary value. Statistics from previous years are analyzed to evaluate current performance and make projections for the future. Since Micheal Lewis's *Moneyball* (2003), the use of saber metrics to evaluate player performance has become extremely popular. Previously players were evaluated by scouts on categories such as mechanics and body form. These are still used today but to a lesser extent. Players are currently compensated based on a team's analysis of past performance and future projections. Long-term contracts are given to high performing and high-potential athletes in order to "lock them up" and prevent a bidding war between teams later on. However, just because a player has performed well in the past does not guarantee that he will perform well in the future. Lackritz (1990) suggests that players should be paid on an annual basis and that their salary should be based on both their individual and team performance that year. From an expectancy theory standpoint this makes a lot of sense. Players will be motivated to perform at a high level in order to obtain higher compensation. It will be as if every year is a free-agent year. Dinerstein (2007) provides further evidence that players should be paid on a year-to-year or short term basis rather than long term. He says that players at the beginning of long-term contracts know that they have locked in specific salaries and may expect that that their current performance will have no impact on their compensation. This may explain why player performance decreases during the first year of a new contract. However Stankiewitcz (2009, pg. 82) findings contradict this view, "a player with a short-term contract will be less productive than a player with a long-term contract". Although she does note that her model does

not differentiate between the different types of players in the MLB. Her findings may be a result of the fact that typically long-term contracts are given to high performing athletes whereas low performing athletes are given short-term deals.

Hypotheses

Three hypotheses will be tested by this study. Each one aimed at evaluating Major League Baseball's current form of player compensation, and how well it motivates players to perform. Table 1 provides a summary of the hypotheses. The hypotheses test expectancy theory's principles and measure player performance and motivation before, during, and after signing a new contract. Expectancy theory predicts that if a player perceives a strong relationship between his performances and subsequent rewards such as the signing of a new contract (high instrumentality). He will be motivated to perform at a high level. However this assumes that the signing of a new contract and pay associated with it is of importance to that player. Therefore one can reason that as long as this is important to a player, then a player in the final year of a contract should be motivated to improve his performance. However after signing a contract, instrumentality is lessened, and thus his motivation to perform is reduced. The first hypothesis will test the difference between the last year of an existing contract and the first year of a new contract. Expectancy theory predicts that a player's performance should be higher during the final year of the existing contract than the first year of the new contract. This is because instrumentality is lessened once a contract is signed. The second hypothesis will test whether player performance increases the closer a player gets to the end of their contract. Expectancy theory predicts that performance will increase the closer a player gets to the end of a contract, because instrumentality is increased. The final hypothesis will test whether multi-year contracts decrease a player's motivation to perform during the first year(s) of a contract. This will be tested by comparing a player's career averages to their performance during the first year(s) of a

contract. Career averages are used a base line for which to compare performance during the first few year(s). Expectancy theory predicts that long term contracts decrease a player motivation to perform because instrumentality is decreased, therefore performance statistics will be lower during the beginning of a contract than career averages.

Table 1 Hypotheses

Performance Comparison	Hypothesis
First year of new contract vs. Final year of existing contract	Player performance is lower during the first year of a new contract than the final year of an existing contract.
Early years of contract vs. Late years of contract	Player performance increases the closer a player gets to the end of a contract period.
Early years of contract vs. Career average	Guaranteed multi-year contracts decrease a player's motivation to perform during the first year/few years of the contract.

*For position players a decrease in performance signifies a drop in each performance category. For starting pitchers a decrease in performance signifies a rise in both ERA and WHIP and a drop in K/9, FPCT, and WAR.

Methodology

In order to gage the MLB's current form of player motivation on team performance, a preliminary analysis consisting of all 30 teams in the MLB from 2000 to 2012 was conducted. Each team's yearly player salary and regular season win-loss record was analyzed using a correlation. The sample for testing the hypotheses consisted of all position players and starting pitchers on an active MLB roster in 2012 who had previously signed a contract extending past or directly following their arbitration eligibility. The sample was limited to those players who also met the following criteria; 1) The player signed a contract of at least three years with a MLB team, 2) the player exceeded 130 at-bats (position players) or 50 innings pitched (starting pitchers) in the season two years prior to the new contract, the year prior to the new contract, and each year of their new contract. 130 at-bats and 50 innings pitched were chosen as they are recognized by the MLB as the qualifications to determine a player's rookie status. In order to ensure accuracy of data only players who were on an active MLB roster in 2012 were included in this study. Contract information on players not on a team in 2012 was either incomplete or unattainable. Contract data was retrieved from Cotscontracts.com. In all 65 players fit the criteria, 45 position players and 20 starting pitchers.

The performance data compiled for each position player included: batting average (BA), slugging percentage (SLG), on-base percentage (OBP), fielding percentage (FPCT), and wins above replacement (WAR). For starting pitchers the performance data compiled included: earned run average (ERA), strikeouts per nine innings pitched (K/9), walks and hits per innings pitched (WHIP), fielding percentage (FPCT), and wins above replacement (WAR). WAR will be used to

compare the performance of starting pitchers to position players. This is a great statistic since one can literally list how valuable a player is to their team, regardless of them being a pitcher or position player, based on their WAR. All performance data was retrieved from espn.com.

All performance measures were compiled for each player during the season two years prior to the new contract, the season prior to the new contract, first year of the new contract, middle year(s) of the contract, and final year of the new contract. In addition the career figures for each player were compiled. A repeated measures analysis of variance was used to analyze the data collected in order to test the hypotheses.

Results

In order to present a base line for the study a Pearson Correlation was run in order to see whether or not there is a direct correlation between Major League Baseball team's yearly salaries and their on-field performance. On-field performance was measured using the number of wins each team earned per year. The Person Correlation is r=0.368 and p=.000, suggesting that there is a correlation between MLB team's yearly salaries and their on-field performance. However this correlation is not perfect.

Position Players

The results of the positions players repeated measures ANOVA as well as mean performance data are presented in Table 2 and 3.

Table 2 Repeated Measures ANOVA for Position Players

Performance Measures	Type III Sum of Squares	df	Mean Square	Greenhouse-Geisser	p
BA	.005	3.265	.001	1.984	.114
SLG	.043	3.242	.013	3.586	.013
OBP	.008	3.120	.003	2.509	.059
FPCT	.001	2.325	.000	1.475	.232
WAR	60.136	2.924	20.565	4.955	.003

Table 3 Position Players Mean/Std. Deviation Performance Statistics

Performance Measures	Two Years Before New Contract	Year Before New Contract	First Year of New Contract	Middle Year(s) of New Contract	Last Year of New Contract	Career Averages
BA	.277/.027	.291/.029	.282/.033	.283/.026	.282/.036	.282/.020
SLG	.447/.086	.483/.077	.456/.076	.459/.065	.444/.075	.456/.057
OBP	.348/.041	.365/.033	.355/.037	.360/.030	.352/.038	.355/.026
FPCT	.981/.019	.986/.011	.985/.012	.986/.011	.984/.017	.984/.012
WAR	2.72/2.07	4.05/1.95	3.24/2.25	3.21/1.88	2.86/2.34	2.65/1.39

The repeated measures ANOVA of position players showed a statistically significant difference between years for SLG and WAR, while OBP approached significance according to the Greenhouse-Geisser. For these statistics a Bonferroni post hoc test was run to show which years there was a statistically significant difference. This test showed that there was a statistically significant difference for SLG between the season one year prior to the new contract and the middle year(s) of the new contract (p=.031) and also the season one year prior to the new contract and the career averages (p=.001). For OBP the test showed a statistically significant difference between the season one year before the new contract and the career averages (p=.006). Finally, the test showed that for WAR there was a statistically significant difference between the season two years before the new contract and season one year prior to the new contract (p=.005), the season prior to the new contract and the middle year(s) of the new contract (p=.038), and the season prior to the new contract and the career averages (p=.000).

Although the Bonferroni post hoc test for the repeated measures ANOVA did not show a statistically significant difference between any of the statistical categories for the season prior to the new contract and first season of the new contract, due to the large differences in means between the two years for BA, SLG, OBP, and WAR a paired samples t-test was run between the two years for each of the statistics. Interestingly each of the t-test's came back significant; BA (p=.05), SLG (p=.009), OBP (p=.028), and WAR (p=.014). Graphs showing the differences between years for each statistical category are provided in the appendix.

The results of this study supported hypothesis 1 with respect to position players and in part hypothesis 2, however it did not support hypothesis 3. As mentioned above the repeated measure ANOVA did not show a statistically significant difference between the season before the new contract and the first season of the new contract however after running a paired sample t-test it was found that the difference in BA, SLG, OBP, and WAR were statistically significant. Just as the hypothesis and expectancy theory predicted player performance decreased between the year prior to a new contract and the first year of the new contract. This is evident both by viewing table 3 as well as the graphs in the appendix.

Hypothesis two as well as expectancy theory had predicted that the closer a player gets to the end of a contract term the more their performance should improve due to an increase in instrumentality. This was supported in part by the fact that performance increased in each statistical category between the season two years prior to a new contract and the season prior to a new contract. Yet, the difference between means in the season two years prior to the season contract and one year prior to the new contract was only found to be statistically significant for

WAR. The hypothesis was only partially supported because there was no significant difference in means or statistically significant difference between the middle year(s) and the final year of the new contract.

The third hypothesis was rejected as career performance figures for position players were lower than, or equal to the performance figures for each statistical category during the first year and middle year(s) of the new contract. Both the hypothesis and expectancy theory had predicted that performance would have been lower during the first few years of the new contract as related to career averages.

Starting Pitchers

The results of the starting pitchers repeated measures ANOVA as well as mean performance data are presented in Table 4 and 5.

Table 4 Repeated Measures ANOVA for Starting Pitchers

Performance Measures	Type III Sum of Squares	Df	Mean Square	Greenhouse-Geisser	p
ERA	2.883	2.911	.991	1.715	.176
K/9	5.639	2.985	1.889	2.046	.118
WHIP	.121	2.590	.047	2.146	.115
FPCT	.005	3.071	.001	.716	.550
WAR	61.543	2.655	23.178	4.236	.012

Table 5 Starting Pitchers Mean/Std. Deviation Performance Statistics

Performance Measures	Two Years Before New Contract	Year Before New Contract	First Year of New Contract	Middle Year(s) of New Contract	Last Year of New Contract	Career Averages
ERA	4.08/.842	3.75/.859	3.59/.738	3.82/.559	3.96/.781	3.89/.364
K/9	7.00/1.44	7.53/1.53	7.68/1.57	7.46/1.45	7.32/1.58	7.28/1.01
WHIP	1.32/.135	1.28/.143	1.22/.152	1.25/.127	1.27/.155	1.28/.081
FPCT	.964/.053	.956/.044	.959/.030	.959/.026	.944/.044	.956/.017
WAR	2.26/1.56	3.74/2.21	4.29/2.50	3.31/1.75	2.61/2.37	2.57/1.04

The repeated measures ANOVA for position players only showed a statistical significance between years for WAR. A Bonferroni post hoc test was then run to see which years there was a statistically significant difference. The test showed that there was a significant difference between the season two years before the new contract and first year of the new contract (p=.007) and the first year of the new contract and career averages (p=.022).

Once again a paired sample t-test was run to compare the season prior to the new contract and the first season of the new contract because of the large difference in means between the two years although the repeated measures ANOVA did not show any statistical significance for any of the performance measures. The paired samples t-test was run for ERA, WHIP, and WAR, but only WHIP came back significant (p=.05). Graphs showing the differences between years for each statistical category are provided in the appendix.

The results of this study for starting pitchers did not support hypotheses 1 and 3 as well as the expectancy theory predictions associated with the two, while providing some support for

hypothesis 2. Interestingly, not only was hypothesis one rejected but the data was completely opposite of what was hypothesized. According to the hypothesis and expectancy theory's predictions a player's performance should decline during the first year of a new contract due to a decrease in instrumentality. Conversely, as seen in table 3, the means improved in each statistical category from the year prior to the new contract and the first year of the new contract, although the difference between the two years was only found statistically significant for WHIP (as mentioned above).

Just as with position players hypothesis 2 was partially accepted as performance improved between the year two years prior to the new contract and year prior to the new contract in each statistical category with the exception of FPCT. It was only partially accepted however because the means of each performance figure decreased between the middle year(s) of the new contract and last year of the new contract. It is also important to note that each of these statistical differences, although large in the context of baseball were not shown to be statistically significant.

The final hypothesis that multi-year contracts decrease a player's motivation to perform during the first year/few years of a contract was rejected. In order for this hypothesis to have been accepted there would have had to have been a significant decrease between a player's performance during the early years of a new contract and career averages. However performance figures were actually better during the first few years of the contract as compared to career averages. Once again the direction was opposite of what expectancy theory predicts. Although it is important to note that career average performance was only higher than performance during

the season two years prior to the new contract as well as ERA and FPCT during the last year of the new contract.

Discussion

This study provides further evidence to Ahlstrom et. al (1999) and Martin et. al (2011) findings that position players motivation to perform and subsequently their performance decreases during the first year of a new contract. It also provides insight into the effects of expectancy theory on starting pitchers, which had not previously been analyzed. The results of this study are very interesting in that they show some support for expectancy theories predictions as related to performance for position players however are almost reverse of what is predicted for starting pitchers. The results show that for position players performance tends to decrease during the first year of a new contract as compared to the year prior to the new contract in every statistical category and although these differences were not shown to be statistically significant in the repeated measures ANOVA, BA, SLG, OBP, and WAR were all shown to be significant in the paired samples t-test. From this it can be reasonably presumed that a position player's motivation to perform is higher during the year prior to the new contract than the first year of the new contract. It is fascinating however that the first year of the new contracts performance, although significantly lower than the year prior to the new contract is still in line with the players' career averages. This could mean that players are not motivated to perform at their highest level any season other than the one prior to signing a new contract.

Conversely starting pitcher performance actually increased in each statistical category during the first year of a new contract in relation to the year prior to the new contract and every other season. However this difference was not found to be statistically significant for any performance measure as analyzed by the repeated measures analysis and only WHIP for the

paired sample t-test. These results as well as the lack of statistical significance could be attributed to the small sample size of 20. Another possible explanation for the increase in performance during the first year of a new contract could be that starting pitchers are not solely motivated by money but rather other factors such as the location with which the team is located, or praise from their teammates, coaches, and fans have an effect on their valence. Finally, starting pitchers may be motivated to prove that they do indeed deserve the contract of which they have just signed. This effect can be explained by equity theories predictions, which has yet to have been studied with respect to starting pitchers.

Recommendations

In a world where players are properly compensated for their performance and motivated to perform at their highest level each year, one could expect to see a perfect correlation between an MLB team's yearly salaries and their on-field performance as well as no sharp or statistically significant changes in any performance measures from one year to the next. The results of this study however shows that this is not currently the case and therefore MLB's form of player compensation and its consequent effect on player motivation to perform can be improved. Previous studies such as Lackritz (1990) and Dinerstein (2007) suggest that the best way to pay players is annually, which conceptually makes a lot of sense from the perspective of expectancy theories predictions. As long as monetary compensation is a main driver of a player's instrumentality and valence then their overall instrumentality should remain at a high level as long as a contract is not guaranteed for more than one year and their next year's salary is linked to their previous year's performance. Although this makes sense conceptually it may not work in the context of baseball. This is because by only offering a player a one year contract this means that after that one year they are free to sign with the team that offers them the most money. It could be argued, that this would cause an increase in overall player salaries, as a bidding war ensues among teams for the highest performing athletes, as well as high performing players to move from teams with low payrolls to those with high. Currently one of the main reasons why organizations sign players to long term contracts is so that they don't have to worry about them leaving their organization unless they are traded. There is also no guarantee that just because the player performed at a certain level the year previous that their numbers will be the same that

year. Although expectancy theory predicts that by offering one year contracts a player may be motivated to perform at his highest level, there are other outside variables of which a player has no control, such as injury, that could affect performance. This means that this system could still result in a correlation between MLB team yearly salary and on-field performance that is less than perfect.

I recommend that Major League Baseball's organizations adopt a system similar to that used in the sales industry: players are signed to long term contracts with a certain amount of guaranteed money based on previous performance and negotiated bonuses for reaching specific statistical milestones. This resembles the commission of a sales employee. This system allows organizations to sign players to long term contracts without being at the total mercy of the individual to perform at the predicted level each year. It also provides motivation for players to perform at their highest level since pay is directly linked to performance, thus increasing instrumentality regardless of how the rest of their team is performing. Thus, allaying the effects of a decrease in player motivation associated with his team being out of playoff contention. Since actual performance or output is directly linked to pay a team can expect for their yearly win-loss record or on-field performance to be closely related to their yearly team salary. An example of how such a contract would work with relation to home run (HR) incentives is presented in Table 6.

One of the key difficulties with changing MLB's current form of player compensation is the strength of Major League Baseball's Players Association (MLBPA) and whether they approve of the changes. However under this system players would have the potential to earn

more money than they are currently. They would just have to earn it. Thus, there is reason to believe that the MLBPA may approve the change. This system will mitigate the effects of contract where players spend the majority or a large portion of their contract on the disabled list, producing numbers significantly lower than projected or previously earned. A team would only be liable for paying the players their guaranteed portion of the contract which would be quite small in comparison to what an organization such as the Yankees are losing in a contract such as Alex Rodriguez's.

The main drawback to this system is the fact that organizations will not have a fixed team salary and may end up spending much more or much less than expected. However through the use of projections and analysis of previous performance, such as what is currently used to determine a player's compensation, teams should be able to develop ballpark figures as to what their team salary will be. On the other hand although they may end up spending a little more than projected they will be reaping the benefits of higher than expected performance and would not have to worry as much about paying their players large sums of money and not seeing a positive outcome on the field. Another issue to discuss is the possible "cheating of the system" by players or teams. For example a team who is out of playoff contention sitting a player so that they do not reach certain statistical milestones associated with pay increases or players developing phony injuries so that specific performance measures do not decrease below the milestone associated with a pay increase. However these types of problems can be eradicated by instituting clauses in contracts where a team must play a player a certain number of games or on the flip side the player must play a certain number of games with a specific percentage coming late in the season

in order to be eligible for the pay increases. It is important to note that in order for this system to work the statistical categories associated with bonuses should be individualistic while linked to overall team performance. This will decrease a player's feelings of in-equity when playing for a lower performing team. Further studies would need to be conducted in order to determine what these statistical categories should be and the size of the pay increase associated with reaching certain statistical milestones.

Table 6 Recommended Systems Compensation Structure Example

Base Salary	$2,500,000
HR Incentives	Bonus
20-25 HR	$1,000,000
26-30 HR	$2,500,000
31-35 HR	$3,000,000
36-40 HR	$4,000,000
Etc.	Etc

Limitations and Future Research

The results presented in this study have certain limitations in terms of analysis. One is the relatively small sample size. Due to the difficulty in acquiring both complete and accurate data with respect to MLB player contract terms only those players who were on an active roster in 2012 and reached the subsequent criteria for this study were able to be included. As a result only 65 total players, 45 position players, and 20 starting pitchers were included. This small sample size may have prevented some of the differences in means between years to be shown as statistically significant.

Another limitation is performance figures used. Each of the figures were chosen due to their use in previous studies or their importance in determining a players level of compensation. However, they may not have equally shown the differences in a players increase in or decrease in motivation. For example, if a player is less motivated and thus spends less time in the batting cage what affect if any would this have on fielding percentage or vice versa?

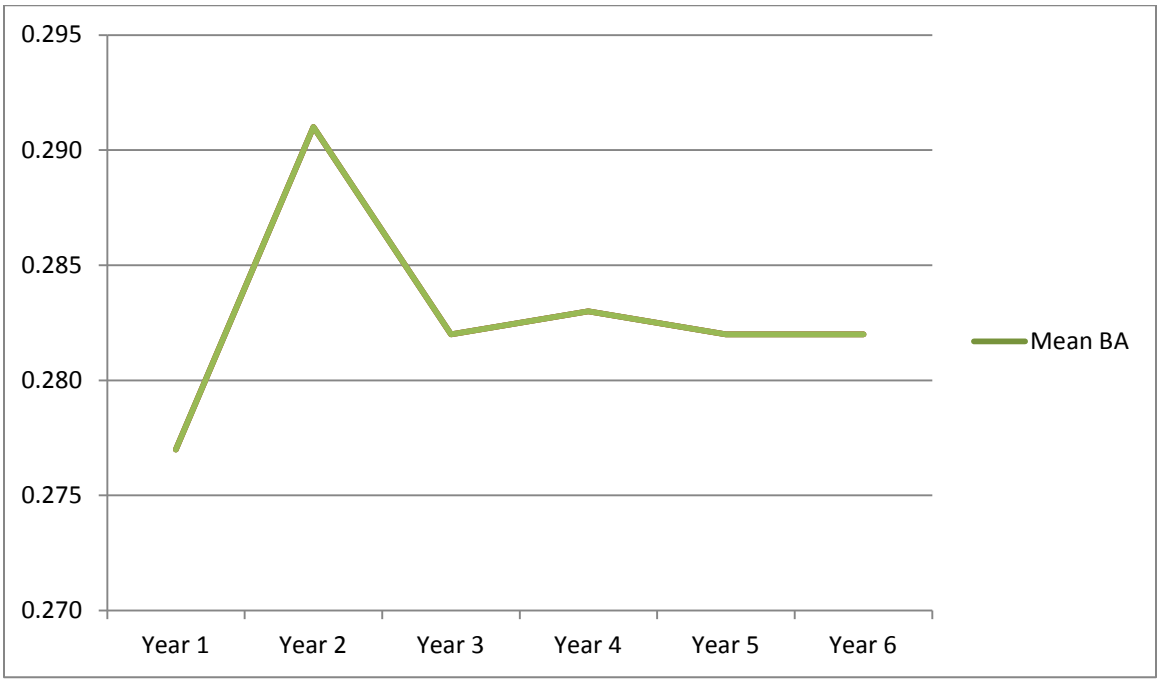
Finally, this study assumes that a player's level of compensation or pay is the primary reward associated with an individual's instrumentality and ultimately has a high valence. However there may be other factors that are more important to certain players such as the location with which the team is located, or praise from their teammates, coaches, and fans.

Conclusion

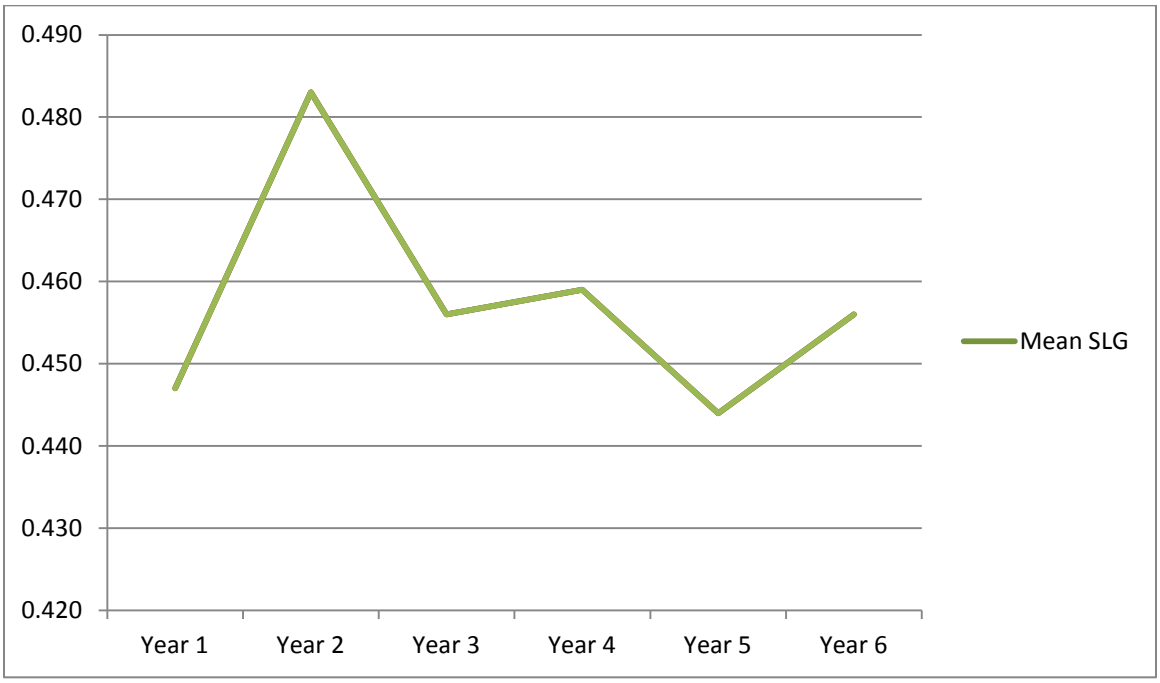
This study provides further evidence that expectancy theory's predictions apply in the context of Major League Baseball positions players. This is evident by the decrease in performance for position players in every statistical category from the season prior to the new contract and the first season of the new contract. This study also presents interesting finding with respect to starting pitchers and expectancy theory's predictions as the results of the statistical analysis were opposite of what expectancy theory predicts. Further research will be needed to understand the exact reasoning behind the starting pitchers performance results as this is the study to have analyzed expectancy theory's predictions using starting pitchers.

Appendix: Statistical Analysis Data

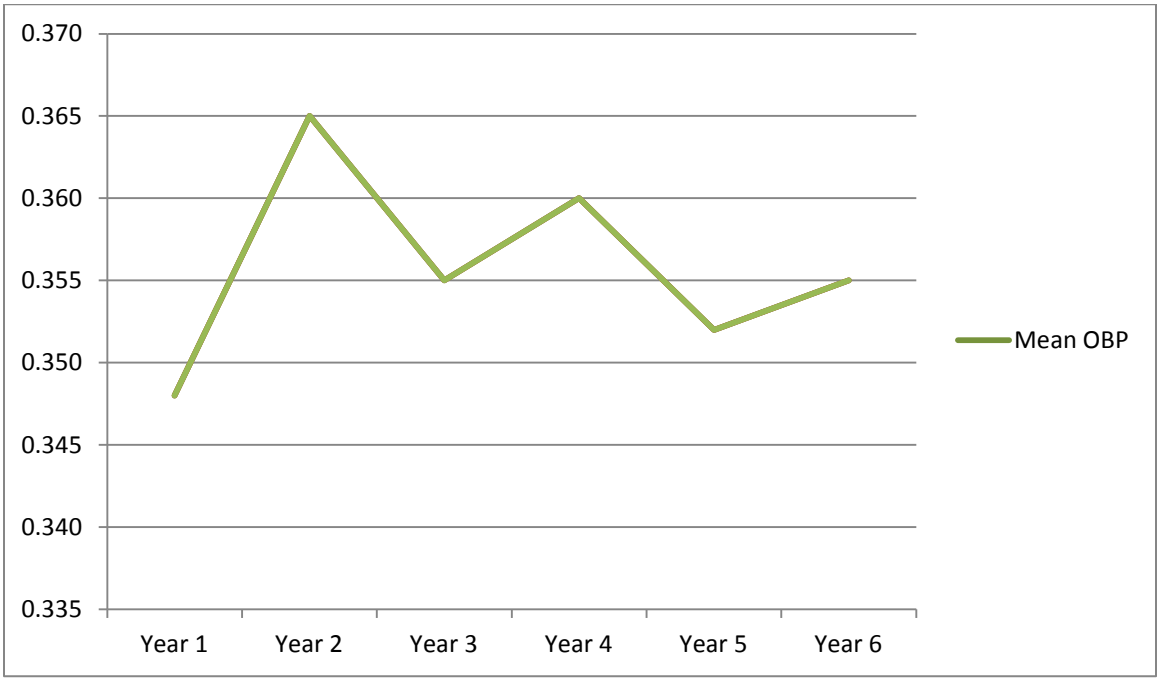
Batting Average Means



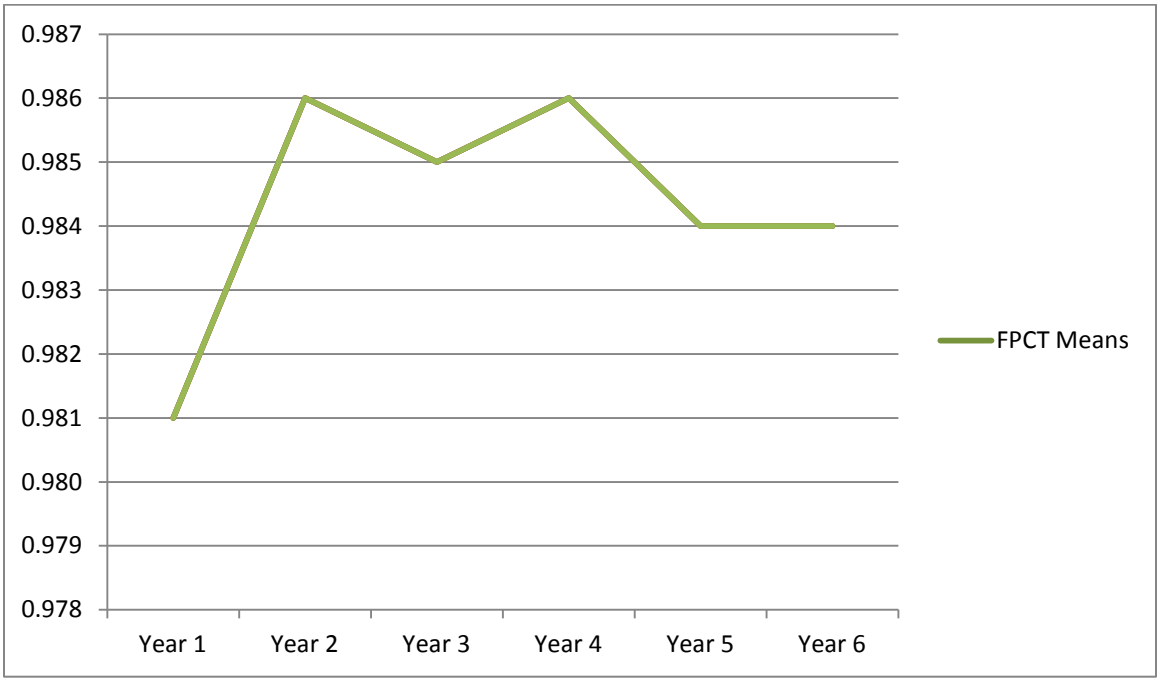
Slugging Percentage Means



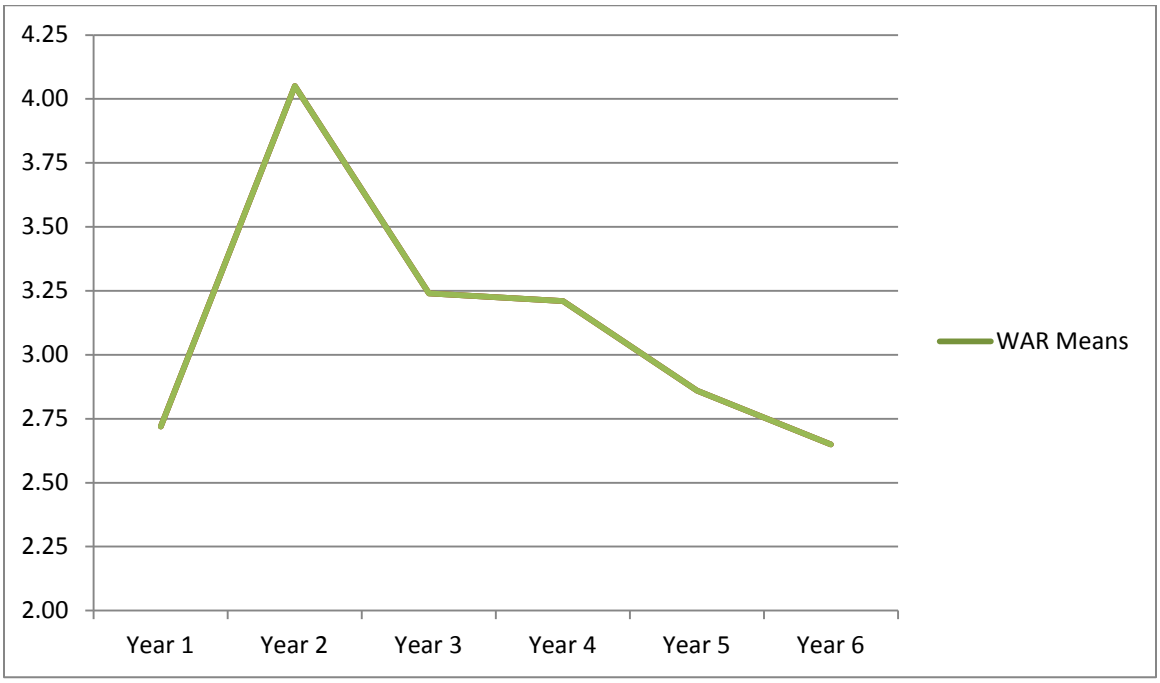
On-Base Percentage Means



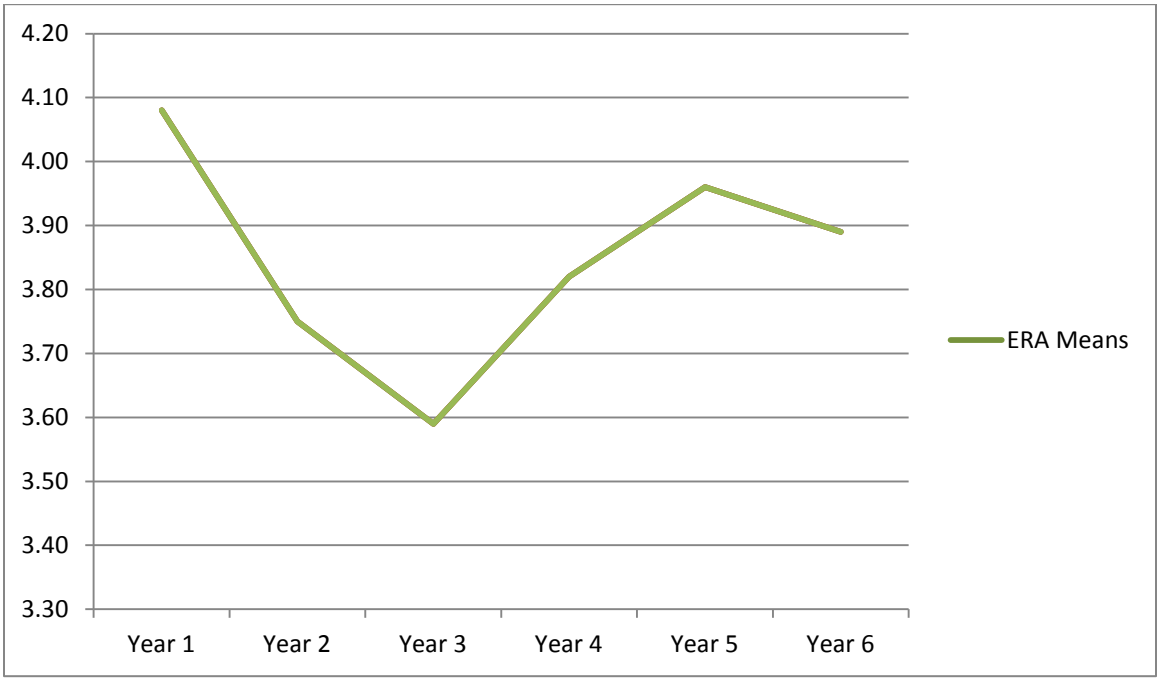
Positions Players FPCT Means



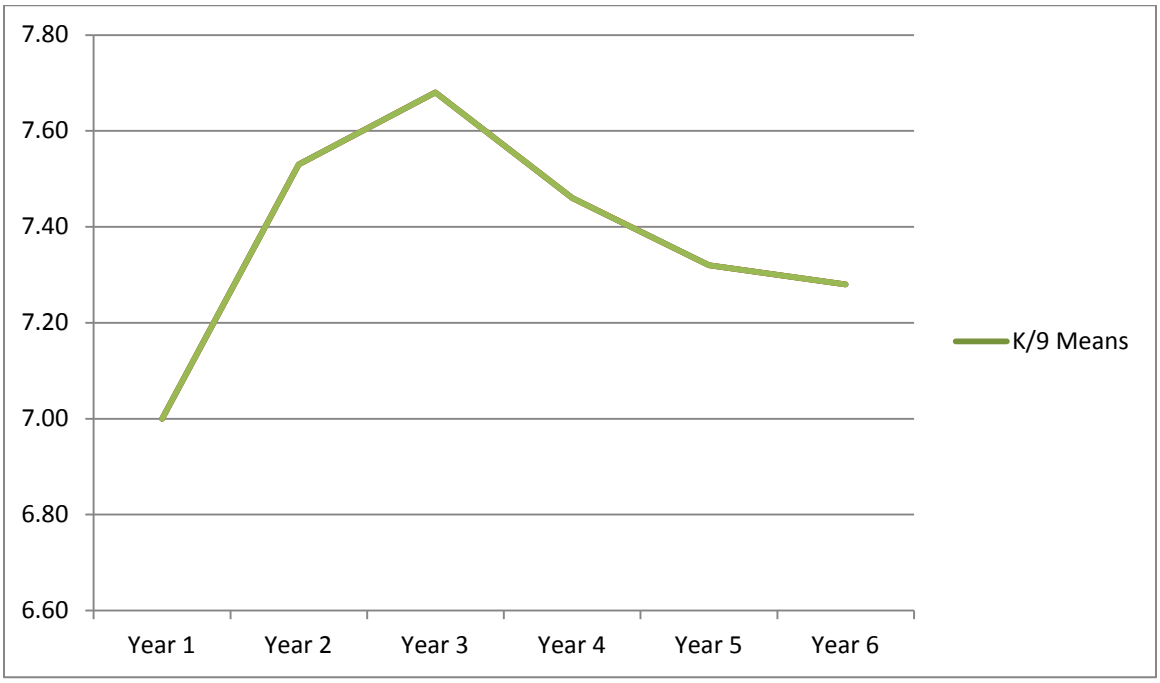
Position Players WAR Means



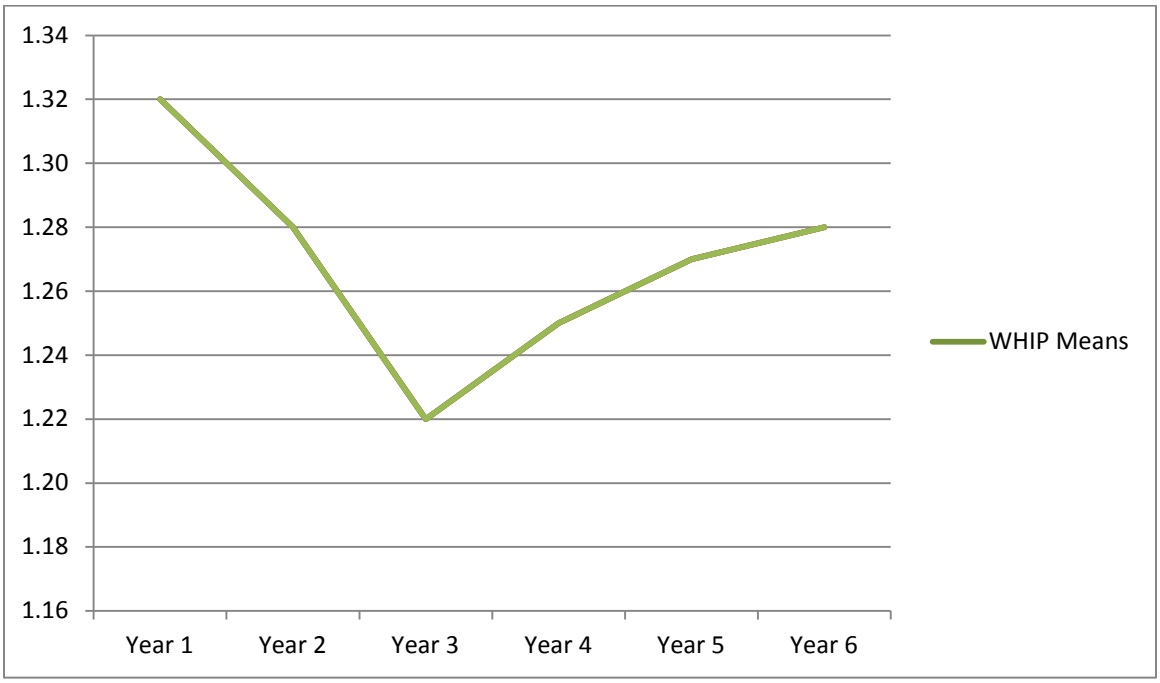
Earned Run Average Means



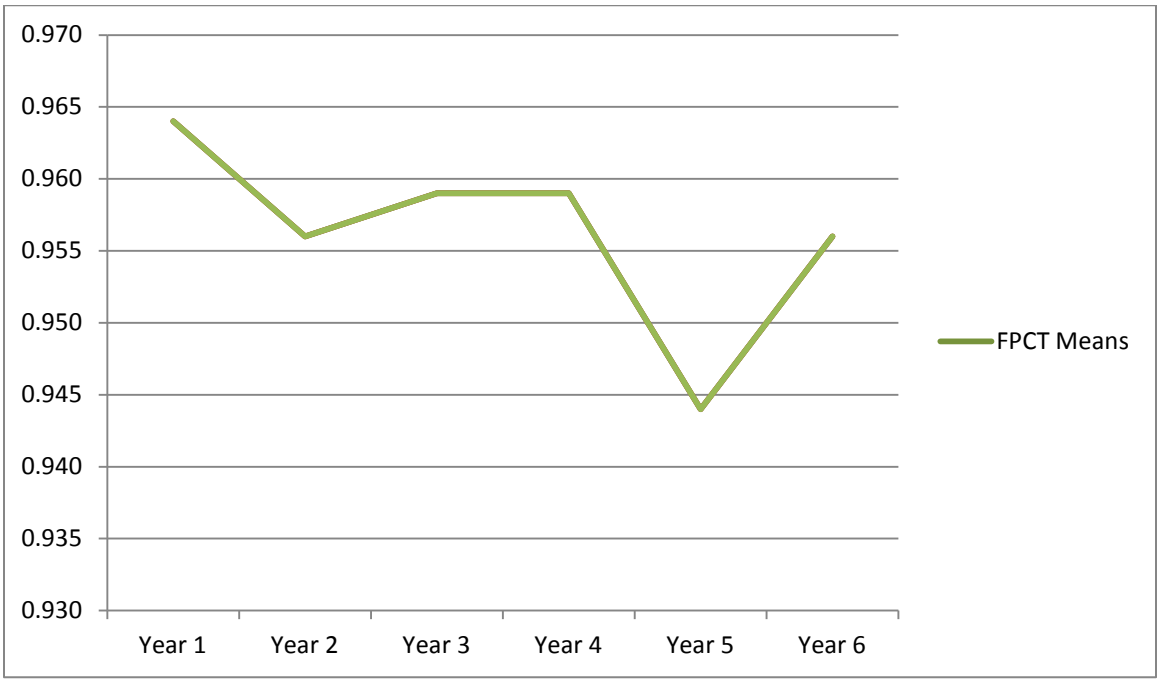
Strikeouts Per Nine Innings Pitched Means



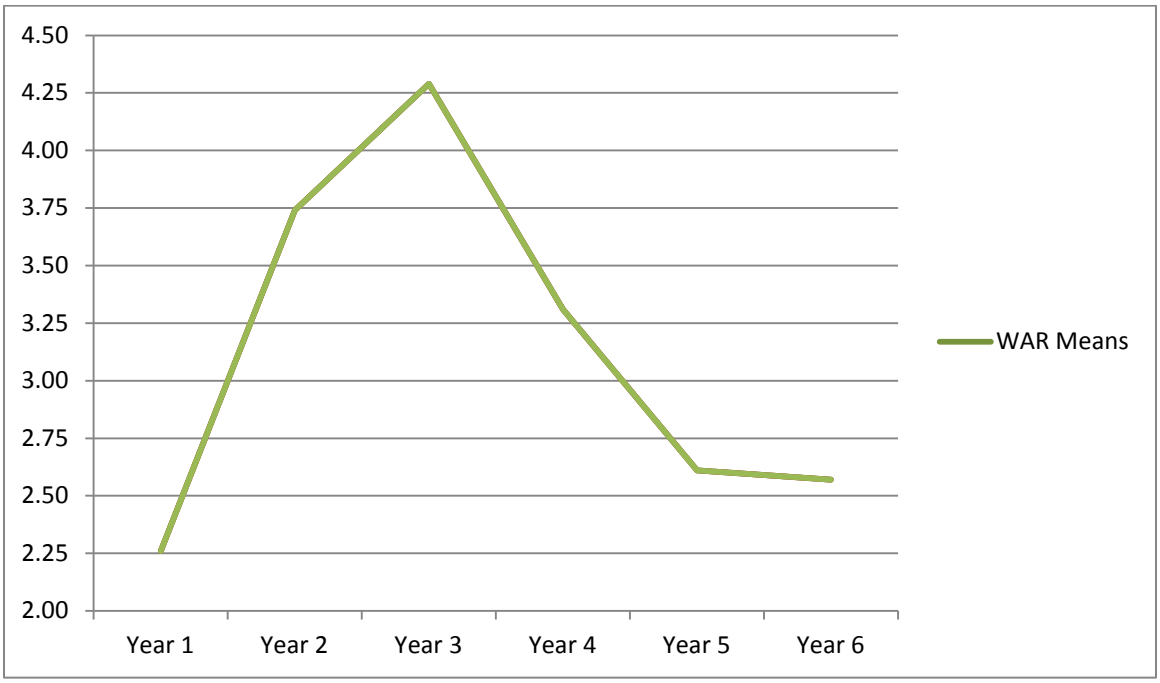
WHIP Means



Starting Pitchers FPCT Means



Starting Pitchers WAR Means



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