The Park Place Economist

Volume 13 | Issue 1 Article 11

4-2005

Does Arbitratration Process Solve Monopsonistic Behaviour in Baseball?

Andrew Tarman '05

Does Arbitratration Process Solve Monopsonistic Behaviour in Baseball?

Abstract

In this paper, I hypothesize that players with less than six years of experience, thus not able to pursue free agency, face monopsony power in terms of their contracts. Furthermore, I believe that players with less than six years of experience have lower salaries than players with the same MRP and more than six years of experience. The arbitration process, I hypothesize, does not rid players with less than six years of experience from monopsonistic behavior. Through this research I hope to measure the impact of monopsony power on baseball players with less than six years of experience to gain a better understanding of the baseball market.

Does the Arbitration Process Solve Monopsonistic Behavior in Baseball?

Andrew Tarman

I. INTRODUCTION

The market for Major League Baseball(MLB) has been researched and explored for decades. One subject of controversy deals with the fairness of the arbitration process. While this process was developed to try to help players receive fair contracts, a simple question arises: Is this process eliminating monopsonistic behavior?

When baseball players sign multimillion dollar contracts, the general public tends to raise an eyebrow and wonder if a single person is worth millions of dollars to simply play a game. Fortunately for baseball, statistics showing player's productivity are easy to measure and readily available. Therefore, economic analysis of the baseball market is permissible.

Baseball players do not just randomly receive high salaries. Owners receive revenue based on player's performances, and owners pay players based on these revenues. In economic terms, owners try to measure a player's marginal revenue product (MRP) of each player before assessing a salary.

"All players in baseball are not in a truly competitive market."

In the baseball market, arbitration-eligibles and free agents try to retain salaries which reflect their MRP of the previous year. While free agents are free to sign with any team in the league, arbitration-eligibles must negotiate with their respective team. Therefore, all players in baseball are not in a truly competitive market.

In this paper, I hypothesize that players with less than six years of experience, thus not able to pursue free agency, face monopsony power in terms of their contracts. Furthermore, I believe that players with less than six years of experience have lower salaries than players with the same MRP and more than six years of experience. The arbitration process, I hypothesize, does not rid players with less than six years of experience from monopsonistic behavior. Through this research I hope to measure the impact of monopsony power on baseball players with less than six years of experience to gain a better understanding of the baseball market.

II. ARBITRATION PROCESS

Before jumping into the literature and models of baseball, it is imperative to discuss the basic characteristics of Major League Baseball. Before baseball arbitration began in 1974, players were drafted onto a team and were not able to test their "market value" by negotiating contracts with other teams. Typically, one owner held the rights to a player and thus had monopsonistic power over him. Consequently, owners often paid players well below their marginal revenue products (Frederick, 1992).

In response, players formed the MLB arbitration process in 1974 to try and regain market power. Final-offer arbitration (FOA), as it is formally known, is set up to give players a chance to increase their salaries before they are able to file for free agency. Through this process, a player with three to six years of experience is eligible for arbitration. If they choose to file for arbitration, the player and his team file a "bid" for the player's salary. While the case is waiting to be heard, negotiations between the two sides are encouraged. If a negotiation cannot be developed, a hearing is held, and a neutral third party

arbitrator will hear each side's final offer and then choose one of the offers (Frederick, 1992).

It is safe to assume that "arbitrators act out of self-interest and a desire to keep their positions" (Frederick, 1992). Since it is important for both players and owners to feel that their cases will be handled fairly, arbitrators should not show favoritism toward either side. Since the institution of this process, Dworkin (1981) indicates that the final results have been even. Of the cases which have been filed, the results are split between the players and the owners. Experts believe that, overall, arbitrators have done a fairly good job balancing the outcome of the arbitration cases.

"It is important for both players and owners to feel that their cases will be handled fairly."

III. REVIEW OF LITERATURE

To be able to measure the impact of the arbitration process on player's salaries, it is first important to develop a model to measure player productivity. In *The Value of Sports Talent*, Rodney Fort (2003) concludes that a general Marginal Revenue Product model is ideal (Fort, 2003). Under this theory, a player's salary can be determined based on productivity measures of a player (Fort, 2003).

In baseball, different statistics are readily available to measure player productivity. Andrew Zimbalist (1992) argues that productivity (PROD), also known as OPS, which adds a player's on-base percentage ((hits + walks + hit by pitches)/ (at bats + walks + sacrifices + hit by pitches)) and slugging percentage (total bases/at bats), is the best measure of a hitter's productivity. At the time, Slugging Percentage was generally used to measure player productivity. However, Zimbalist (1992) believes that while Slugging Percentage "is a good indicator of offensive performance, it excludes one major component of offensive contribution, walks" (Zimbalist, 1992). Therefore, OPS should be used because it not only takes into account power statistics, but also walks.

Alan Schwarz (2004) agrees with Zimbalist that OPS is the best statistic to measure a hitter's productivity. As Schwarz explains, this statistic "measures the key areas of offensive production: getting on base and advancing runners" (Schwarz, 2004). As he further explains in his article, looking at SLG without OPS "is like subsisting on food without water" (Schwarz, 2004) because both are necessary.

Will Irwin (2003) takes another approach to measure offensive productivity by using a Runs Created (RC) variable. He argues that this variable "eliminates some of the team bias that is implicit in (offensive) data" (Irwin, 2003). Runs Created, as Irwin indicates, "gives one player more credit than another when each run is scored" (Irwin, 2003). Therefore, players are measured for their offensive production to the team.

Phillip Miller (2000) conducts both a theoretical and empirical comparison of negotiated salaries determined in baseball's free agent system to those determined in its final-offer arbitration system. In his work, Miller concludes that there is a difference in the salary structure for arbitration eligibles and free agent players (Miller, 2000). Also, while he finds out that there is a significant positive relationship between the salaries of free agents directly affecting the negotiated salaries of arbitration eligibles, Miller concludes that the systems do not determine equal salaries for players with the same MRP (Miller, 2000).

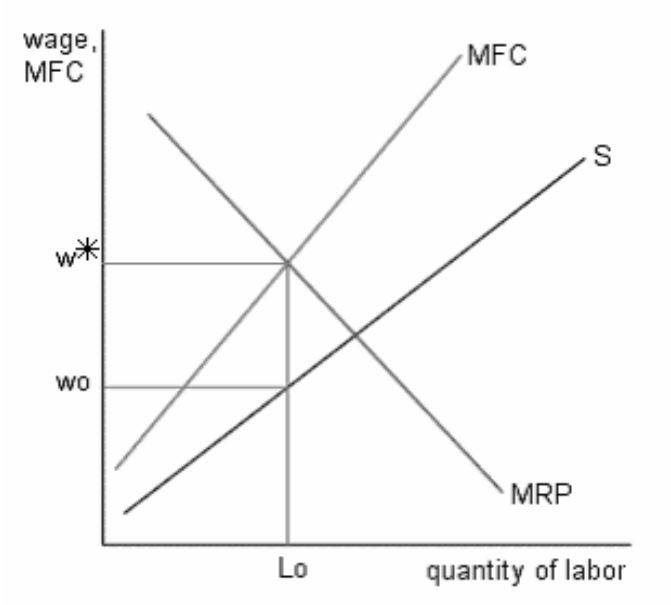
Marburger (1996) uses MRP models to test salary with respect to years of experience. In his study, he concludes that experience is in fact significant when determining a player's salary (Marburger, 1996). Furthermore, he concludes that players with more than six years of experience, thus able to freely sign with any team, are subject to salaries closest to their marginal revenue products. This supports the notion that the arbitration process does not fully eliminate monopsonistic behavior.

IV. THEORETICAL FRAMEWORK

This study makes use of the human capital theory, which states that players should be compensated based on certain productivity measures. Since productivity is possible to measure in baseball, this theory is applicable to this research. Salary is therefore determined by certain productivity measures.

This research also makes use of the monopsony model. This model is shown in Figure 1.

FIGURE 1:
Monopsony Model



In this market, there are several sellers of service (players), but there is only one buyer (owners). Therefore, the cost for each additional unit purchased raises MFC above the supply curve. In an arbitration system, the two wages submitted to the arbitrator would be bounded by the two constraints on the monopsony model: w* and wo. Wo represents the lowest wage that would cause a player to supply labor to baseball. W* represents the player's MRP which he could expect in the free agent market. If arbitrators have evenly dispersed the number of winners between owners and players, the "average" wage would fall between these two constraints. Therefore, arbitration eligibles still face monopsonistic power because their actual wage is less than their MRP. In this research, it is this decrease in wage below w* which is trying to be measured.

V. DATA

This model uses strictly outfielders because these individuals generally have the highest offensive production numbers. Consequently, their salaries generally reflect offensive production. The first sample consists of 228 outfielders who were granted free agency and signed a new contract between 1990 and 2003. This sample represents players who have more than six years of experience who can sign with any team. Therefore, the wages of these players closely represent their productivity. Table 1 lists the variables and descriptive statistics for free agents.

The second sample consists of 19 outfielders who applied for and received a hearing in the arbitration process. This sample represents players with three to six years of experience who are not able to sign with a new team. Therefore, the salaries of these

TABLE 1
Variables and Descriptions (Free Agents)

Predicted Sign	Statistic	Name	Definition	Mean	Max	Min	Std. Dev.
	Dependent Variable						
	SAL	Salary	Value of Contract	$2,373,403	$15,341,857	$150,820	$2,475,762
	Independent Variable						
+	GP	Games Played	Games Played before contract was awarded	115	163	11	29.9
+	OPS (PROD)	OPS (PROD)	Slugging % + On-base %	778.69	1378	376	109.7
+	RC	Runs Created	(Hits+walks) * (Total Bases) / (Plate Appearances)	56.7	209	0	31.2

TABLE 2
Variables and Descriptions (Arbitration)

Predicted Sign	Statistic	Name	Definition	Mean	Max	Min	Std. Dev.
	Dependent Variable						
	SAL	Salary	Value of Contract	$2,433,659	$6,557,377	$496,999	$1,593,898
	Independent Variable						
+	GP	Games Played	Games Played before contract was awarded	136.2	162	67	29.4
+	OPS (PROD)	OPS (PROD)	Slugging % + On-base %	778.5	971	631	89.8
+	RC	Runs Created	(Hits+walks) * (Total Bases) / (Plate Appearances)	74.4	119	19	32.3

players are the result of some monopsony power. Table 2 lists the variables and descriptive statistics for arbitration players: (TABLE 2)

It is important to note that players who sign pre-arbitration contracts are excluded because of data constraints. These players generally sign out of high school or college and do not have readily available statistics to measure their productivity. Therefore, only arbitration-eligibles and free agents who sign a contract are used.

For each player, offensive statistics as well as games played from the year prior to signing a new contract or filing for arbitration is used. For example, if a player signed a new contract in 1992, the offensive statistics from 1991 are used. These statistics are used because owners will use previous offensive productivity measures to determine the value of each player. Also, the salaries are computed into 2003 dollar figures using the CPI index. Therefore, all dollar values should be interpreted in 2003 dollar figures.

These statistics can be found on www.baseballreference.com or www.espn.com. To find data for players who have either filed for arbitration or free agency, www.roadsidephotos.com is an excellent site and was used for this study. This website offers a complete list of players filing for free agency and arbitration as well as the year in which this was done.

VI. EMPIRICAL FRAMEWORK

This study researches and measures the impact of monopsony power on baseball players with less than six years of experience. To measure this impact, the research uses four simple linear regressions by using ordinary least squares (OLS). Each regression assumes that salary is determined through basic human capital theory. Also, each regression makes use of MRP theory. This indicates that salary is determined by productivity measures. Lastly, each regression is "structured" the same so a meaningful comparison of coefficients can be done. This will allow for an insightful measure of the monopsonistic impact on arbitration-eligibles. The dependent variable for each regression is salary. In the two equations, the independent variables will be the production variables OPS and RC. The control variable, Games Played (GP), is included to measure another dimension of the player's contribution to the team during the year.

The first set of equations makes use of the OPS productivity measure. With this productivity measure, the Equation 1 is used:

$$SAL = \beta_1 + \beta_2 \, OPS + \beta_3 \, GP + \varepsilon \qquad (1)$$

I will run Equation 1 separately for both the arbitra-

TABLE 3
Regression Results (OPS Model)

Dependent Variable				
Statistic				
SAL	**Free Agents**		**Arbitration-Eligible**	
Independent Variables				
Statistic	**Coefficients**	**T-statistic**	**Coefficients**	**T-statistic**
OPS	11,001	9.540 ***	6,177	1.974 *
GP	29,171	6.900 ***	31,223	3.265 ***
R Square	0.459		0.513	
Adjusted R^2	0.454		0.453	
Sample Size	227		18	

Values in parentheses are absolute t -statistics
* indicates significance at the .10 level
** indicates significance at the .05 level
*** indicates significance at the .01 level

tion-eligible players and free agent players. Again, this is done to measure the monopsonistic impact of the arbitration process.

The second set of equations makes use of the RC productivity measure. With this productivity measure, Equation 2 is used:

$$SAL = \alpha_1 + \alpha_2 RC + \alpha_3 GP + \varepsilon \qquad (2)$$

I will run Equation 2 for both the arbitration-eligible players and free agent players. Just as with the OPS productivity measure, this is done to measure the monopsonistic impact of the arbitration process.

VII. RESULTS

The results for the first set of equations using the OPS Model are found in Table 3. As shown in this table, the hypothesis that arbitration-eligible players with less than six years of experience, thus not able to pursue free agency, face monopsony power in terms of their contracts is supported. A one-unit increase in OPS for a free agent results in an

TABLE 4
Regression Results (RC Model)

Dependent Variable				
Statistic				
SAL	**Free Agents**		**Arbitration-Eligible**	
Independent Variables				
Statistic	**Coefficients**	**T-statistic**	**Coefficients**	**T-statistic**
RC	78,053	18.448 ***	45,271	3.022 ***
GP	-18,575	4.210 ***	-8,602	-0.523
R Square	0.698		0.615	
Adjusted R^2	0.695		0.567	
Sample Size	227		18	

Values in parentheses are absolute t -statistics
* indicates significance at the .10 level
** indicates significance at the .05 level
*** indicates significance at the .01 level

$11,001 increase in salary. However, a one-unit increase in OPS for an arbitration-eligible player increases salary by $6,177.

The regression results for the RC model are found in Table 4. These results also support the hypothesis that arbitration-eligible players face monopsonistic power in terms of their contracts. A one-unit increase in RC for a free-agent player is accompanied by a $78,053 increase in salary. However, the same one-unit increase in RC for an arbitration-eligible player results in only a $45,271 increase in salary.

As Irwin (2004) predicted, this trend should exist based on the human capital theory. However, it is important to note that the sign for GP in this model is not what was predicted. After running correlation tests regarding these two variables, it is apparent that a significant correlation problem exists. These tests are shown in Table 5 and Table 6. As a person increases their games played, their respective RC variable increases. This is due to the fact that more games played results in more at bats. Since RC is influenced by at bats, more games played will have a positive effect on RC. RC is flawed because it is not a standardized variable. Therefore, this model may not be desirable for this application.

To put these results into perspective, Table 7 is presented including all of the arbitration-eligible players who received a new contract: (TABLE 7)

Included in this table is the name of the player who filed for arbitration, their actual salary, the predicted salary had they been a free agent using both the OPS and RC models, and their respective productivity measures. To determine the predicted salary, each player's respective productivity measures were plugged into the predicted free agent models (OPS and RC).

As this table indicates, 14 out of the 18 players who filed for arbitration would have received a higher salary had they been free agents using the OPS model. Also, 11 out of the 18 players would have received a higher salary had they been a free agent using the RC model. Just as Miller (2000) explained in his research, these players face monopsonistic behavior in terms of their respective contracts.

TABLE 5
Correlations (Arbitration)

		rc	Games Played
rc	Pearson Correlation	1	.859(**)
	Sig. (2-tailed)	.	.000
	N	19	19
Games Played	Pearson Correlation	.859(**)	1
	Sig. (2-tailed)	.000	.
	N	19	19

** Correlation is significant at the 0.01 level (2 -tailed).

"14 out of the 18 players who filed for arbitration would have received higher salary had they been free agents using the OPS model."

TABLE 6
Correlations (Free Agent)

		rc	Games Played
rc	Pearson Correlation	1	.727(**)
	Sig. (2-tailed)	.	.000
	N	228	228
Games Played	Pearson Correlation	.727(**)	1
	Sig. (2-tailed)	.000	.
	N	228	228

** Correlation is significant at the 0.01 level (2-tailed).

VIII. CONCLUSION

The results of the regressions and analysis indicate that players with less than six years of experience, who must consequently use the arbitration process, face some monopsony power in terms of their salaries. The productivity variables comparing the two markets clearly show that the players face two different equations. The slope to OPS and RC almost doubles for players who are free agents, signifying that monopsony power still exists for arbitration-eligible players.

Miller (2000), Marburger (1996), and this research signify that only players with more than six years of experience will receive salaries closely reflecting of their MRP. This is true because only

TABLE 7
Player Information

Player's Names 1990	Salaries next year 1991 Salary	Salaries after CPI	Predicted Sal OPS FA Model	Predicted Sal RC FA Model	OPS	RC	Games Played
Mike Aldrete	$510,000	$688,987	$975,225	($217,941)	702	19	96
Barry Bonds	$2,300,000	$3,107,195	$5,538,973	$6,565,695	971	119	151
Bobby Bonilla	$2,400,000	$3,242,291	$4,360,351	$5,383,839	840	106	160
1991	1992						
Glenn Braggs	$1,000,000	$1,311,475	$1,237,408	$1,157,170	755	34	85
Jay Buhner	$1,445,000	$1,895,082	$3,634,408	$2,688,959	835	66	137
Luis Polonia	$1,650,000	$2,163,934	$2,869,504	$3,540,222	731	80	150
Ruben Sierra	$5,000,000	$6,557,377	$4,598,545	$6,379,947	859	119	161
1992	1993						
Marquis Grissom	$1,500,000	$1,910,035	$3,231,055	$3,919,416	740	87	159
Darrin Jackson	$2,100,000	$2,674,048	$2,399,290	$2,198,507	675	64	155
1993	1994						
Brian McRae	$1,900,000	$2,358,974	$3,034,026	$3,718,655	738	83	153
1994	1995						
Darren Lewis	$1,850,000	$2,233,596	$1,445,299	$2,179,550	697	54	114
1995	1996						
Bernie Williams	$3,000,000	$3,518,164	$4,322,661	$5,681,036	879	106	144
1996	1997						
Tom Goodwin	$1,050,000	$1,203,738	$1,928,222	$1,875,038	664	57	143
1998	1999						
Midre Cummings	$450,000	$496,999	$1,823,452	$476,834	856	21	67
Johnny Damon	$2,100,000	$2,319,328	$3,707,445	$4,506,686	778	95	161
Brian L. Hunter	$1,750,000	$1,932,773	$1,536,010	$1,971,665	631	58	142
Matt Lawton	$1,700,000	$1,877,551	$4,402,012	$4,986,070	865	99	152
1999	2000						
Karim Garcia	$700,000	$747,967	$1,272,258	$1,108,952	729	36	96
2002	2003						
Carlos Beltran	$6,000,000	$6,000,000	$4,495,702	$5,658,899	847	110	162

these players can freely "shop" their value on the market. Also, Table 7 clearly shows the relationship between arbitration salaries and free agent salaries. In more than half of the cases for each model, OPS or RC, players in an arbitration market with the exact same productivity measures as players in a free agent market would have received a higher salary in a free agent market.

Certain issues regarding the arbitration process still arise. In future research, the relationship to an arbitrator's decision may be explored. Since research shows that arbitrators split their decisions among the owners and players, a model to determine the best coefficients which predict a player winning the arbitration process would be beneficial.

Future research could also explore the relationship between arbitration-eligible players and free agent players for all positions. If models could depict MRP for all players, a more accurate depiction of the market could be developed. Expanding these principles to pitchers, for example, could be explored to see if position players and pitchers face different market powers.

REFERENCES

Baseball-Reference.com. 7 October 2004. Available < http://baseballreference.com/>.

Dworkin, James B. *Owners Versus Players*. Boston: Auburn House Publishing Company, 1981.

ESPN.com 2004. ESPN, Inc. 7 October 2004 <http://sports.espn.go.com/mlb/players>.

Fort, Rodney D. "The Value of Sports Talent." *Sports Economics*. New Jersey:

Prentice Hall, 2003: 177-224.

Frederick, David, William Kaempfer, and Richard Woobbekind. "Salary Arbitration as a Market Substitute." *Diamonds Are Forever*. Ed. Paul Sommers. Washington D. C.: Brookings Institution, 1992: 29-49.

Irwin, Will. "Racial Discrimination in Major League Baseball, Can it exist when Productivity is Crystal Clear?" Senior Research Honors, Illinois Wesleyan University, 2004.

Marburger, Daniel R. "A Comparison of Salary Determination in the Free Agent and Salary Arbitration Markets." *Baseball Economics: Current Research*. Ed. John Fizel, Elizabeth Gustafson, and Lawrence Hadley. London: Praeger Publishers, 1996: 67-76.

Miller, Phillip A. "A Theoretical and Empirical Comparison of Free Agent and Aribtration-Eligible Salaries Negotiated in Major League Baseball." *Southern Economic Journal*. July 2000: 87-104.

Schwarz, Alan. "WHIP It Good…Statistically." ESPN.com. 21 January 2004. <http://sports.espn.go.com/mlb/columns/story ?columnist=Schwarz_alan&ID=1713520>.

Zimbalist, Andrew. "Salaries and Performance: Beyond the Scully Model." *Diamonds Are Forever*. Ed. Paul Sommers. Washington D. C.: Brookings Institution, 1992: 109-133.