HAS SALARY DISCRIMINATION *REALLY* DISAPPEARED FROM MAJOR LEAGUE BASEBALL?

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INTRODUCTION

One of the most thoroughly studied aspects of the labor market is that of wage discrimination. Especially since the passage of the Equal Pay Act (1963) and the Civil Rights Act (1964), a substantial body of research has addressed the question of the extent to which minorities receive the "equal pay for equal work" that the acts set forth as a fundamental goal. Perhaps the most serious conceptual problem with such studies, however, is the difficulty of measuring the productivity of workers. For example, education and experience, two traditional proxy measures of productivity, may be either unavailable in a detailed form or biased by measurement error. Sports, in general, and baseball in particular, are often cited as ideal areas of study for researchers because, through the publishing of virtually every performance and compensation statistic imaginable, worker productivity and detailed salary figures are readily available for analysis. In "The Sports Business as a Labor Market Laboratory," Kahn [2000, 75] writes:

> Professional sports offer a unique opportunity for labor market research. There is no research setting other than sports where we know the name, face, and life history of every production worker and supervisor in the industry. Total compensation packages and performance statistics for each individual are widely available, and we have a complete data set of worker-employer matches over the career of each production worker and supervisor in the industry. These statistics are much more detailed and accurate than typical microdata samples such as the Census or the Current Population Survey.

Another reason to focus on professional sports is their symbolic importance to Americans. Major League Baseball (MLB) is extremely visible to any American and is

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expected to be representative of the nation's ideals, evidenced by its enduring nickname of "the national pastime." While there is abundant evidence suggesting that salary discrimination had essentially disappeared from MLB by the 1980s (see Kahn's review in 1991 and his 2000 update), other forms of discrimination may still be present.[1]

The purpose of this paper is twofold. First, to revisit the question of overall salary discrimination in MLB using a current and highly detailed data set. Second, and more important, to investigate whether salary discrimination may exist in salary groups that other studies have neglected to examine. Specifically, particular attention is paid to whether discrimination has indeed vanished across the entire salary range of players or if it is still present in the upper or lower salary ranges. Discrimination has traditionally been investigated at the mean; this paper evaluates the extent of salary discrimination in three salary groups – low, middle, and high. Furthermore, the implications of the findings may extend beyond professional baseball. After all, there is really no compelling economic or social significance of investigating an industry that does not appear to be representative of the typical worker where the lowest paid workers are earning several hundreds of thousands of dollars. The significance is the possibility that these results could shed light on the broader labor market canvas.

DISCUSSION

Modern neoclassical theory of labor market discrimination originates with the work of Gary Becker [1957]. He discusses three types of taste-based discrimination: employer (owners), employee (teammates), and customer (fans). Since taste-based discrimination involves costs to the discriminator, competitive market pressure should have the effect of removing employer and employee discrimination over time (assuming that owners and teammates are profit/income maximizers). However, it is legitimate to question the assumption that MLB owners are profit maximizers (as well as the assumption that MLB is a competitive market structure). If owners are viewed as utility maximizers and have a taste for discrimination, they could indulge that taste for a considerable length of time, given their personal wealth. Customer (fan) discrimination could also exist indefinitely, given utility maximization. That is, fans may be content to support their favorite team as long as the team has a racial/ethnic makeup that appeals to them. It is, however, important to consider team winning performance and its relation to the utility function of owners, teammates, and fans. If owners, teammates, and fans care more about team winning success than in indulging their taste for discrimination, then team composition will be subservient to team success.[2]

Thus, obvious racism seems to have diminished significantly in sports. But what about players who are not critical to their team's success? On any team, there are several players who are not everyday players; this distinction has been noted in several studies, including Scully [1974]. The players who fill out the roster and are involved only marginally in the team's on-field success may remain subject to discrimination. For them, the cost of discrimination to owners, teammates, or fans will be considerably less. Our hypothesis is that discrimination is more likely to occur in the low-salaried group; it is there that the cost of discrimination is lowest.

LITERATURE

The literature on salary discrimination in Major League Baseball blossomed in the 1970s. One of the first such studies was that of Gerald Scully [1974]. Scully argued that he found several pieces of "evidence of salary discrimination." For example, he found that black hitters earned less than white hitters of equal performance statistics except at ability levels less than those needed to sustain a career in the major leagues. Thus, Scully's results indicated that in 1970 there was some evidence of salary discrimination by race for nonpitchers in the major leagues. However, several later studies suggested that racial wage discrimination in the major leagues was either nonexistent or slight (see, for example, Medoff [1975], Mogull [1975], Cymrot [1983], Raimondo [1983], and Hill and Spellman [1984]).

The salary discrimination literature has tapered off since the early 1980s, perhaps because the issue seems to have been resolved. Kahn [2000,85] reviewed the literature in 1991 and again in 2000, concluding in 2000 that "…regression analyses of salaries in baseball and football have not found much evidence of racial salary discrimination against minorities."

DATA

The data for this study were collected from a number of sources. The race/ethnicity data were obtained (observed) from the espn.com and mlb.com websites that contain individual pictures and places of birth of each of the players (see Fort and Gill [2000] for a discussion of the issues involved in observing racial or ethnic characteristics). The salary data are from the year 2001, and were obtained from the cbs.sportsline.com website. Age and career batting average statistics were found in *Baseball America's 2001 Almanac* [Simpson, 2000]. The career slugging percentage, on base percentage, career at bats per year, and runs created per 27 outs were obtained from *Bill James' Stats Inc. Major League Handbook 2001* [James, 2000]. Receipt of a career gold glove and years of MLB experience were found on the mlb.com website. Finally, figures on career fielding percentage through the 2000 season and number of years of minor league experience were obtained from the *2001 Sporting News Baseball Register* [Paur and Walton, 2001].

All career statistics used were calculated through the 2000 season, as they would likely be the productivity determinants of the salary for the 2001 season in the "equal pay for equal work" spirit. Players with less than three years of MLB experience were omitted from the analysis because such players are often paid salaries that are not representative of their MLB performance, since they possess little experience; rather, such salaries are based largely on the potential of the player. We prefer to focus on the impact of measured MLB performance on MLB salary. Furthermore, players with little baseball experience may possess career statistics that are a misleading predictor of future success in the major leagues and bias the results. Additionally, players with three years of experience are entitled to salary arbitration, which allows them to bargain for salary based on past performance. Finally, players of Asian origin were discarded from the dataset due to small sample sizes. The data set consists of 362 major league non-pitching players: 171 white, 81 black, and 110 Hispanic.

THE MODEL AND VARIABLES

The model specification is:

$$\begin{aligned} LNSALARY_i = {} & \beta_0 + \beta_1 MLBEXP_i + \beta_2 MLBEXPSQ_i + \beta_3 SLU_i + \\ & \beta_4 ABPERYEAR_i + \beta_5 RCPERGAME_i + \\ & \beta_6 MINOREXP_i + \beta_7 GOLD_i + \beta_8 FIELDPCT_i + \varepsilon_i, \end{aligned} \tag{1}$$

where $LNSALARY_i$ is the natural logarithm of player i's 2001 salary, $MLBEXP_i$ is player i's number of years of MLB experience through the 2000 season, $MLBEXPSQ_i$ is the square of player i's number of years of MLB experience through the 2000 season, SLU_i is player i's career slugging percentage through the 2000 season, $ABPERYEAR_i$ is player i's career major league at-bats divided by number of years of major league experience through the 2000 season, $RCPERGAME_i$ reflects the career runs created per 27 outs measure through the 2000 season of player i (see James [2000]), $MINOREXP_i$ is player i's number of years in which he played 20 or more games for a minor league team, $GOLD_i$ is a dummy variable taking on value 1 if player i has been a gold glove award winner at any time in his career and value 0 otherwise, and $FIELDPCT_i$ is player i's career fielding percentage through the 2000 season.

This specification was chosen because it includes the important performance characteristics from both an intuitive sense, and which are common in the literature. It should be noted that career batting average and on-base percentage were discarded from the regressions for several reasons. First, the calculation of batting average is contained entirely in slugging percentage; in fact, slugging percentage actually explains more of a player's ability to score runs because it accounts for extra base hits, while batting average equates all hits. On-base percentage was omitted from the model because it is very much governed by a person hitting his way on base, as is slugging percentage; thus, multicollinearity problems could result if both were left in the model, while little appears to be lost in omitting on-base percentage. Furthermore, runs created per 27 outs accounts for the aspects of on-base percentage that slugging percentage does not. Finally, slugging percentage is the preferred measure of choice in the literature.

EMPIRICAL ANALYSIS

The empirical analysis proceeds as follows. First, the "best" equation is estimated to determine the extent to which the aforementioned variables determine salary. The sample is then divided into two groups: group I contains blacks and whites, while group II contains Hispanics and whites. The general specification and a model containing racial dummy shift and interaction variables are regressed on both groups. A reduction of errors sum of squares test (RESST) is then performed to determine if there are racial or ethnic differences in salary determination over the entire dataset.[3] Finally, the analysis is extended by repeating the process with respect to low, middle, and high salary groups.

TABLE 1
Means (Std. Dev.) and Variable Definitions

Variables	white	Hispanic	black
SALARY	2,686,063	3,035,792	3,557,498
	(2,827,837)	(3,659,525)	(3,401,405)
AGE	30.95	29.05	31.35
	(3.66)	(3.67)	(4.14)
MLBEXP	7.36	6.73	8.59
	(3.66)	(3.42)	(4.35)
SLU	0.426	0.417	0.424
	(0.062)	(0.075)	(0.073)
ABPERYEAR	291.0	296.4	330.9
	(138.7)	(134.4)	(139.2)
RCPERGAME	5.00	4.71	4.96
	(1.26)	(1.37)	(1.37)
MINOREXP	5.62	6.01	5.49
	(2.31)	(1.97)	(2.04)
GOLD	0.14	0.11	0.16
	(0.35)	(0.31)	(0.37)
FIELDPCT	0.981	0.977	0.979
	(0.013)	(0.013)	(0.010)
SAMPLE SIZE	171	110	81

Variable Definitions

SALARY	2001 salary.
AGE	Age at end of 2000 season.
MLBEXP	Number of years of major league experience through the 2000 season.
SLU	Career slugging percentage through the 2000 season.
ABPERYEAR	Career major league at bats/MLBEXP.
RCPERGAME	Career runs created per 27 outs through the 2000 season (see James [2000]).
MINOREXP	Number of years played 20+ games in the minor leagues.
GOLD	Equals 1 if gold glove award winner at any time during major league career.
FIELDPCT	Career fielding percentage through the 2000 season.

Table 1 is instructive as it identifies the characteristics of the groups in the sample. Particularly noteworthy is that black players earn the highest salaries, followed by Hispanics, and then whites.[4] Table 2 shows the empirical results follow expectations; the coefficients can be easily interpreted since the dependent variable is log salary.[5] Model (2) is model (1) absent the MINOREXP and FIELDPCT variables; those variables were eliminated due to the fact that, as displayed in Table 2, they were not significant at the .05 level of significance in model (1) and the adjusted R^2 of the model increases with their elimination.

A RESST is employed for each racial/ethnic group to determine whether inclusion of a dummy race variable with interaction terms explains significantly more variation in log salaries in model (2). Model (4) in Table 2 is a regression of model (2) on group I, to be used as the restricted model in the RESST. The unrestricted model to be used in the RESST for group I is model (5) in Table 2. Model (5) indicates the RESST will probably not indicate any difference in the wage structure of whites and blacks since neither the dummy shift variable nor any of the interaction variables has a significant impact on log salary at the .05 level. Moreover, the adjusted R^2 actually falls by introducing the shift and interaction variables, signifying that the unrestricted model is weaker; the additional variables apparently contribute nothing to the model's explanatory power.

TABLE 2
Regression Results (absolute t-value)

VARIABLE	Model (1)	Model (2)	Model (3)	Model (4)	Model (5)	Model (6)	Model (7)
INTERCEPT	7.230**	9.298**	9.249**	9.362**	9.137**	9.132**	9.137**
	(2.91)	(36.36)	(35.68)	(29.77)	(21.87)	(30.63)	(22.44)
MLBEXP	.480**	.480**	.482**	.445**	.422**	.487**	.422**
	(13.56)	(13.88)	(13.91)	(11.26)	(7.97)	(11.39)	(8.18)
MLBEXPSQ	-.023**	-.023**	-.023**	-.021**	-.020**	-.024**	-.020**
	(12.27)	(12.48)	(12.48)	(10.25)	(6.57)	(9.62)	(6.74)
SLU	2.206*	2.123*	2.072*	2.515*	3.947**	2.804*	3.947**
	(2.24)	(2.17)	(2.12)	(2.11)	(2.62)	(2.54)	(2.69)
ABPERYEAR	.005**	.005**	.005**	.004**	.004**	.005**	.004**
	(12.82)	(15.12)	(14.80)	(11.87)	(9.63)	(13.88)	(9.88)
RCPERGAME	.129*	.137**	.144**	.124*	.060	.100	.060
	(2.45)	(2.65)	(2.77)	(2.02)	(0.82)	(1.76)	(0.84)
MINOREXP	-.011						
	(0.58)						
GOLD	.230*	.249*	.255*	.290*	.243	.197	.243
	(2.23)	(2.45)	(2.50)	(2.49)	(0.26)	(1.66)	(1.67)
FIELDPCT	2.197						
	(0.87)						
BLACK			.056		.648		
			(0.70)		(1.04)		
HISP			.087				-.290
			(1.21)				(0.48)
BMLBEXP					.022		
					(0.26)		
BMLBEXPSQ					-.003		
					(0.60)		
BSLU					-4.294		
					(1.69)		
BABPERYEAR					0.00		
					(0.03)		
BRCPERGAME					.248		
					(1.74)		
BGOLD					.104		
					(0.43)		
HMLBEXP							.222*
							(2.41)
HMLBEXPSQ							-.014*
							(2.58)
HSLU							-2.727
							(1.22)
HABPERYEAR							.001
							(1.35)
HRCPERGAME							.114
							(0.96)
HGOLD							-.057
							(0.23)
SAMPLE SIZE	362	362	362	252	252	281	281
ADJUSTED R^2	0.7889	0.7894	0.7892	0.7835	0.7817	0.7881	0.7921

Notes: BMLBEXP=BLACK*MLBEXP; HMLBEXP=HISP*MLBEXP; etc.
* Significant at .05 level.
** Significant at .01 level.

Models (6) and (7) are the restricted and unrestricted models for the RESST on group II. Unlike model (5), model (7) shows that for group II the adjusted R^2 increases when the interaction variables are added, and the interaction variables relating to major league experience are significant at the .05 level.

The F-statistics of the RESST for groups I and II, shown in Table 3, confirm the initial observations; that is, the null hypothesis that the dummy shift and interaction variables are identically equal to zero cannot be rejected at the .05 level of significance. In other words, evidence of racial/ethnic salary discrimination in the overall sample is not observed.

TABLE 3
RESST Tests

GROUP		CALCULATED F-VALUE	CRITICAL F-VALUE (.05)	DECISION (ACCEPT OR REJECT HYPOTHESIS OF DISCRIMINATION)
I	(b/w; all)	0.694	2.010	Reject
II	(h/w; all)	1.944	2.010	Reject
IL	(b/w; low)	3.730*	2.100	Accept
IIL	(h/w; low)	3.876*	2.100	Accept
IM	(b/w; middle)	0.881	2.148	Reject
IIM	(h/w; middle)	0.895	2.132	Reject
IH	(b/w; high)	2.573	2.710	Reject
IIH	(h/w; high)	0.708	2.710	Reject

* Statistically significant at .01 level.

Extended Analysis – Grouping Players by Salary Level

The research is extended by ascertaining whether there is a racial difference in returns to productivity characteristics at different wage levels. Groups I and II are each further divided into three salary levels: low (under $2,000,000), middle (at least $2,000,000 but less than $7,000,000), and high (at least $7,000,000). RESST tests are then employed at each salary level to determine if evidence of racial or ethnic salary discrimination exists in that group. This question is important because it recognizes that nondiscriminatory compensation for minorities who reach the highest salary levels could obscure discrimination against minorities at low salary levels, explaining the fact that this and other studies have found no racial discrimination in the overall dataset.

Group IL is composed of black and white players who belong to the low salary group; group IM is black and white players in the middle salary group; and group IH is black and white players in the high salary group. Groups IIL, IIM, and IIH respectively represent the low, middle, and high wage groups of whites and Hispanics. RESST tests are performed for groups IL, IM, IH, IIL, IIM, and IIH. Model (2) is estimated for each group as the restricted model and the unrestricted model adds the respective racial dummy shift and interaction terms.

Table 4, which shows the regression results, indicates that in the low wage groups and group IH, significant racial differences in compensation could exist, as the ad-

justed R^2 values of the unrestricted models are much higher than those of the restricted models. For the other three groups, however, the adjusted R^2 values either decrease or remain the same; hence, negative salary effects from belonging to a minority group generally are unlikely to be found.

The RESST tests are shown in Table 3. In the case of group IL, the null hypothesis that the black interaction and dummy shift variables are identically zero is rejected at the .05 level of significance. An even stronger statement can be made, however, because the calculated test statistic exceeds the critical value of the RESST at the .01 level of significance. Similarly, in group IIL the null hypothesis that the Hispanic interaction variables and dummy shift variables are all identically zero is also rejected at the .01 level. However, the null hypothesis is not rejected at the .05 level in the case of groups IM, IIM, IH, and IIH. Thus, additional variance in log wages is explained at the lowest salary levels by including the race and ethnicity variables. Further analysis will determine the extent to which these salary gaps are possibly due to discrimination.

Discrimination in Groups IL and IIL?

The foregoing analysis indicates that the unrestricted models regressed on groups IL and IIL explain log salaries significantly better than does the restricted model which does not account for race. In this section a Oaxaca-type wage decomposition is employed to ascertain the extent of the wage gap that may be due to discrimination.

First, the unadjusted difference in means, or gap, of black and white wages at the lowest salary level is determined by developing two normal equations,

$$\bar{Y}_0 = \bar{x}_0 b_0 \text{ and } \bar{Y}_1 = \bar{x}_1 b_1,$$

where $\bar{x}_0$ is the vector for whites at the lowest salary level of the means of the six variables in model (2) and $\bar{b}_0$ is each variable's respective coefficient on each of the variables in model (2). The second normal equation is the product of the same vectors for blacks at the lowest salary level. The difference between the two represents the unadjusted difference in means, or the black/white gap. The vector $\hat{Y}_1 = \bar{x}_1 b_0$ is the mean vector for blacks at the lowest salary level if they received the same returns to their attributes that whites receive. Thus, the difference between black wages and white wages is the sum of two terms,

$$\hat{Y}_1 - \bar{Y}_1 = \bar{x}_1 (b_0 - b_1) \text{ and } \bar{Y}_0 - \hat{Y}_1 = (\bar{x}_0 - \bar{x}_1) b_0.$$

The first equation represents the portion of the black/white gap at the lowest wage level due to whites and blacks experiencing different returns to their attributes (difference due to structure). The second equation is the portion of the black/white gap

at the lowest wage level that is due to blacks and whites possessing different characteristics. Hence, the percentage of discrimination that blacks could face at the lowest wage level is the first equation divided by the entire gap (also equal to the sum of the first equation and second equations). The portion of the black/white gap at the lowest wage level that could be due to discrimination is 86.3%. Further, the calculations reveal that most of this possible discrimination is due to the fact that whites are better compensated for major league experience and slugging percentage. Similarly, the results indicate that the percentage of the Hispanic/white salary gap at the lowest salary level that may be due to discrimination is 91.5%. Again, the gap is due primarily to Hispanic hitters receiving lower returns to MLB experience and slugging percentage than their white counterparts.

CONCLUSIONS AND RECONCILIATIONS

This paper addresses the classic labor question of wage discrimination, applied to the market for Major League Baseball players. The sport possesses extremely accessible performance data, which allow for a model with fewer proxies for worker productivity than general labor market studies. While several previous studies have addressed this topic, this paper extends the literature in a number of ways. First, the sample size in this study is larger than others. Second, a current data set is constructed that includes several detailed performance variables thought to be related to major league salaries. Third, while other recent studies have not found compelling evidence of salary discrimination overall (as in this study), this paper considers the possibility of discrimination in different salary classes where such discrimination may be more likely to exist. Fourth, we decompose the wage gap and calculate the magnitude of possible discrimination gaps. Finally, we identify the variables for which minorities are not as well compensated as whites.

The results of this study indicate that black and Hispanic salary discrimination occurs in the lowest salary group, but is not apparent in middle or high level salary groups. Further, it is found that where discrimination appears to exist, it is likely due to the fact that minorities are not compensated as well as whites for major league experience and slugging percentage. It appears that salary discrimination by race does not exist on a large scale in baseball today, likely because baseball fans are more interested in having a winning team than they are in having a white team. Thus, salary premiums are distributed to the players with the best performance attributes. To the extent that this is true, the “equal pay for equal work” ideal is preserved and discrimination no longer exists. As is shown in this study, however, discrimination may still exist for minorities in the lower salary ranges. Perhaps some discriminatory tastes still exist against minority players with below-average major league abilities. It may be simply less costly to discriminate against marginal players. In other words, it may be true that white fans may indeed prefer to see some white ballplayers, but only so long as winning is not compromised.

TABLE 4
Regression Results for Interactive and Combined Models, by Group (absolute t-value)

Variable	Restricted Group IL	Unrestricted Group IL	Restrict. Group IIL	Unrestrict. Group IIL	Restrict. Group IM	Unrestrict. Group IM	Restrict. GroupIIM	Unrestrict. Group IIM	Restrict. Group IH	Unrestrict. Group IH	Restrict. Group IIH	Unrestrict. Group IIH
sample size	133	133	154	154	90	90	98	98	29	29	29	29
intercept	10.299**	9.671**	10.350**	9.671**	12.848**	13.109**	13.255**	13.110**	14.435**	13.029**	12.621**	13.029**
	(31.05)	(23.26)	(31.73)	(24.01)	(35.25)	(26.97)	(38.44)	(26.57)	(23.60)	(15.640	(13.15)	(9.58)
mlbexp	.320**	.519**	.417**	.519**	.137**	.129**	.138**	.129**	-.027	.043	.200	.043
	(7.96)	(8.14)	(8.36)	(8.40)	(3.50)	(2.87)	(3.67)	(2.83)	(0.28)	(0.39)	(1.94)	(0.24)
mlbexpsq	-.015**	-.028**	-.021**	-.028**	-.005**	-.005*	-.005**	-.005	.000	-.004	-.011	-.004
	(6.72)	(7.10)	(6.84)	(7.33)	(2.80)	(2.11)	(2.73)	(2.08)	(0.03)	(0.73)	(2.07)	(0.45)
slu	3.112*	3.236*	1.477	3.234*	2.819**	1.512	.986	1.512	3.056*	5.028**	4.110*	5.028
	(2.47)	(2.24)	(1.28)	(2.32)	(2.73)	(1.08)	(1.00)	(1.06)	(2.47)	(3.18)	(2.45)	(1.95)
abperyear	.002**	.003**	.003**	.003**	.001*	.001	.001**	.001	.001	.002	.001	.002
	(5.24)	(5.19)	(6.64)	(5.36)	(2.52)	(1.74)	(2.83)	(1.71)	(1.71)	(1.93)	(1.15)	(1.18)
rcpergame	-.006	-.008	.048	-.008	0.005	.068	0.073	.068	-.026	-.069	-.002	-.069
	(0.09)	(0.11)	(0.81)	(0.11)	(0.10)	(1.08)	(1.52)	(1.07)	(0.46)	(1.00)	(0.02)	(0.61)
gold	.402	0.278	-.004	.278	.084	.109	.058	.109	.150	.371**	.211	.371*
	(1.61)	(0.90)	(0.02)	(0.93)	(1.13)	(1.16)	(0.74)	(1.14)	(1.74)	(3.63)	(2.03)	(2.22)
fieldpct												
black		1.302*				-.678				2.744*		
		(2.04)				(0.85)				(2.52)		
Hisp				1.989**				-.565				-1.77
				(3.08)				(0.64)				(0.72)
bmlbexp		-.293**				.047				-.279		
		(3.30)				(0.47)				(1.73)		
bmlbexpsq		.020**				-.004				.014		
		(3.96)				(0.70)				(1.87)		
bslu		-1.055				2.779				-3.013		
		(0.37)				(1.26)				(1.32)		
babperyear		-0.001				0.000				0.000		
		(0.74)				(0.51)				(0.22)		
brcpergame		-0.038				-.132				.029		
		(0.19)				(0.97)				(0.28)		

TABLE 4 — *Continued*

Regression Results for Interactive and Combined Models, by Group (absolute t-value)

Variable	Restricted Group IL	Unrestricted Group IL	Restrict. Group IIL	Unrestrict. Group IIL	Restrict. Group IM	Unrestrict. Group IM	Restrict. GroupIIM	Unrestrict. Group IIM	Restrict. Group IH	Unrestrict. Group IH	Restrict. Group IIH	Unrestrict. Group IIH
bgold		.143				-.062				-.491**		
		(0.28)				(0.37)				(3.08)		
hmlbexp				-.303**				.147				.301
				(3.09)				(1.24)				(1.27)
hmlbexpsq				.021**				-.009				-.014
				(3.49)				(1.31)				(1.22)
hslu				-4.312				-.482				-.386
				(1.90)				(0.23)				(0.08)
habperyear				0.00				.001				-.001
				(0.54)				(0.96)				(0.24)
hrcpergame				.115				.017				.125
				(0.97)				(0.17)				(0.71)
hgold				-1.238*				-.048				-.202
				(2.18)				(0.23)				(0.68)
adjusted R^2	0.5802	0.6355	0.5512	0.6053	0.3749	0.3685	0.3810	0.3681	0.3084	0.5391	0.3353	0.2672

* Significant at .05 level.

** Significant at .01 level.

NOTES

1. Studies have focused on the question of whether minority baseball players are subject to positional discrimination [Eide and Irani, 1996], longer terms in the minor leagues [Bellemore, 2001], unequal Hall of Fame and all-star voting results [Jewell, et al., 2002; Desser, et al., 1999; Hanssen and Andersen, 1999; Findlay and Reid, 1997], or face less desirable contract structures [Marburger, 1996].
2. While team success is undoubtedly important to fans, other factors, among them league competitive balance, have been shown to be significantly related to league-wide attendance. For a summary of this literature, see Fort and Maxcy [2003].
3. The RESST test, which is an F-test on a set of regression coefficients, is described in Pindyck and Rubinfeld [1981, 116-26].
4. The differences are even more pronounced when considering median salaries. Since mean salaries may be greatly affected by the earnings of a few superstars (e.g., Alex Rodriguez's $22 million in 2001), it should be noted that the median salaries are: black=$2,873,439; Hispanic=$1,500,000; white=$1,375,000.
5. For the correct interpretation of the coefficient on dummy variables in semilogarithmic equations, see Halvorsen and Palmquist [1980].

REFERENCES

Becker, G. *The Economics of Discrimination*. Chicago: The University of Chicago Press, 1957.

Bellemore, F. Racial and Ethnic Discrimination: Promotion in Major League Baseball. *Journal of Sports Economics*, November 2001, 356-68.

Cymrot, D. Migration Trends and Earnings of Free Agents in Major League Baseball 1976-1979. *Economic Inquiry*, October 1983, 545-56.

Desser, A., Monks, J., and Robinson, M. Baseball Hall of Fame Voting: A Test of the Customer Discrimination Hypothesis. *Social Science Quarterly*, September 1999, 591-603.

Eide, E. and Irani, D. Positional Segregation in Major League Baseball: 1961-1990. Fizel, J., Gustafson, E., and Hadley, L., eds. *Baseball Economics.* Westport, Connecticut: Praeger, 1996, 179-90.

Findlay, D. and Reid, C. Voting Behavior, Discrimination, and the National Baseball Hall of Fame, *Economic Inquiry*, July 1997, 562-78.

Fort, R. and Gill, A. Race and Ethnicity Assessment in Baseball Card Markets. *Journal of Sports Economics*, February 2000, 21-38.

Fort, R. and Maxcy, J. Competitive Balance in Sports Leagues: An Introduction, *Journal of Sports Economics*, May 2003, 154-60.

Halvorsen, R. and Palmquist, R. The Interpretation of Dummy Variables in Semilogarithmic Equations. *American Economic Review*, June 1980, 474-5.

Hanssen, F. and Andersen, T. Has Discrimination Lessened Over Time? A Test Using Baseball's All-Star Vote. *Economic Inquiry*, April 1999, 326-52.

Hill, J. and Spellman, W. Pay Discrimination in Baseball, Data from the Seventies. *Industrial Relations*, Winter 1984, 103-112.

James, B. *Bill James presents Stats Major League Handbook 2001*. Morton Grove, Illinois: STATS Publishing, 2000.

Jewell, R., Brown, R., and Miles, S. Measuring Discrimination in Major League Baseball; Evidence from the Baseball Hall of Fame. *Applied Economics*, January 2002, 167-77.

Kahn, L. Discrimination in Professional Sports: A Survey of the Literature. *Industrial and Labor Relations Review,* April 1991, 395-418.

_____. The Sports Business as a Labor Market Laboratory. *The Journal of Economic Perspectives*, Summer 2000, 75-94.

Marburger, D. Racial Discrimination and Long-Term Contracts in Major League Baseball. *Review of Black Political Economy*, Summer 1996, 83-94.

Medoff, M. A Reappraisal of Racial Discrimination Against Blacks in Professional Baseball. *Review of Black Political Economy*, Spring 1975, 259-68.

Mogull, R. Salary Discrimination in Major League Baseball. *Review of Black Political Economy*, Spring 1975, 269-79.

Paur, J. and Walton, D., eds. *The Sporting News Baseball Register 2001 Edition*. St. Louis: Vulcan Print Media, 2001.

Pindyck, R. and Rubinfeld, D. *Economic Models and Economic Forecasts* (2nd ed.). New York: McGraw-Hill, 1981.

Raimondo, H. Free Agents' Impact on the Labor Market for Baseball Players. *Journal of Labor Research*, Spring 1983, 183-93.

Scully, G. Discrimination: The Case of Baseball. In Noll, R., ed. *Government and the Sports Business*. Washington, D.C.: The Brookings Institution, 1974, 221-74.

Simpson, A., ed. *Baseball America 2001 Almanac*. Durham, NC: Simon & Schuster, 2000.