Measuring Discrimination in Major League Baseball: Evidence from the Baseball Hall of Fame*

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ABSTRACT

This paper examines the effects of race on player induction into the National Baseball Hall of Fame, concentrating on a player's first ballot. We find limited evidence that retired Major League Baseball players who were born in Latin American countries receive fewer votes on their first ballot; however, the results are sensitive to the specification chosen. In addition, we find little evidence of bias among voters against black players. However, we find stronger evidence that discrimination in voting may exist for players who are both black and Latin. Furthermore, the results show that race does not seem to affect whether a player actually receives enough votes to get into the Hall of Fame on his first ballot. Instead, it appears that any discrimination in voting is concentrated among those players who would not have received enough votes for to enter the Hall of Fame based solely on their career statistics. (JEL J7, D72)

I. Introduction

Each year, members of the Baseball Writer's Association of America (BBWAA) vote on the most significant performance-related award in Major League Baseball (MLB), induction into the National Baseball Hall of Fame. In this paper, we examine whether a retired player's race affects his probability of entering the Hall of Fame. If voting members of the BBWAA have biases against minority-race players, then these players may be less likely to enter the Hall of Fame. In general, the sports industry has proven to be a fruitful area in which to test for racial biases and discrimination since detailed data exist on player and team performance. In the context of Hall of Fame voting, the availability of detailed measures of player performance allow us to isolate the effect of a player's race on the BBWAA's voting outcome.

Unlike many other industries, available data on player productivity in the sports industry have allowed researchers to investigate the effect of race on labor market outcomes such as salaries and hiring. Kahn and Sherer (1988) and Koch and Vander Hill (1988) find that white players in the National Basketball Association (NBA) are paid significantly more than equally skilled black players. Using more recent data, Hamilton (1997) finds that the premium paid to white NBA players is most notable at the upper end of the salary distribution. Using National Football League (NFL) data, Kahn (1992) finds no evidence of statistically significant salary discrimination. Several studies have also investigated race-based salary differentials in MLB. Kahn (1991) reviews these studies and finds little evidence of significant salary discrimination. Singell (1991) shows that black ex-players are less likely to be hired as coaches in MLB than their white counterparts. Brown, Spiro, and Keenan (1991) and Burdekin and Idson (1991) show that players are sorted to NBA teams partially based on their race.

Following Becker (1971), economists generally think of discrimination as emanating from

one of three sources, employers, employees, or customers. Most evidence points to customers as the primary source of any salary and hiring discrimination in the sports industry. For example, if white customers are willing to pay more to see white athletes and the majority of fans are white, then teams with race-neutral preferences may respond by paying white players more than non-white players or by preferentially hiring white players. Results using NFL data imply that white players earn higher salaries in largely white metropolitan areas, while non-white players earn higher salaries in largely non-white areas (Kahn, 1992). Evidence from MLB suggests that teams with more black players have lower attendance and revenue (Gwartney and Haworth, 1974; Scully, 1973; Sommers and Quinton, 1982). Anderson and La Croix (1991), Gabriel, Johnson, and Stanton (1995, 1999), and Nardinelli and Simon (1990) examine the market for baseball cards and find evidence that baseball card purchasers discriminate against both Latin and black players in favor of Anglo players. Kahn and Sherer (1988) show that NBA teams with more black players have lower attendance. Furthermore, Brown and Jewell (1994, 1995) show that fans of college basketball teams pay a premium to see white players.

Race-based discrimination in voting on performance-related awards has received relatively little attention from researchers. Hanssen and Anderson (1999) study the behavior of fans who vote on the starters for the MLB All-Star Game each year. If fans are willing to pay more to see players of their own race, then they may also be more likely to vote for players of their own race as All-Stars. The authors find that white players tend to receive more votes than equally qualified black players, although the vote differential has narrowed over time. This result is important to player compensation since many baseball players have incentive clauses in their contracts tied to performance-related awards. In addition, performance-related awards gain a player national recognition that can lead to greater compensation through endorsements.

In the same way that an appearance in the MLB All-Star Game provides an active player greater recognition, induction into the National Baseball Hall of Fame provides a retired player greater recognition and possibly greater earning power. Each year the BBWAA chooses among eligible retired MLB players to induct into the Hall of Fame, any player receiving a 75 percent vote being elevated to Hall of Fame status. According to Hall of Fame rules, "voting should be based upon the player's record, playing ability, integrity, sportsmanship, character, and contributions to the team(s) on which the player played." In evaluating a player, each writer-voter attaches some subjective importance to these factors and then decides whether a player is worthy of being inducted into the Hall of Fame. Thus, racial bias among writers will impact a player's chances of induction. In addition, if writers have race-based preferences, they may indirectly affect the preferences of fans (customers) and, therefore, be a source of any observed discrimination in MLB.

Findlay and Reid (1997) examine whether the voting members of the BBWAA exhibit racial biases in their voting behavior. The authors categorize players as "Latin" if their birthplace is a Latin American country, "black" if they are of African descent and American-born, or "white" if they do not fall into the first two categories. The authors find limited evidence that African-American and Latin players are treated differently than white players in Hall of Fame voting. In particular, there is some evidence of discrimination against Latin players, though it seems to have diminished over time. Alternatively, black players receive favorable treatment in voting, but this result is inconsistent across specifications.

This paper extends existing research on voting for the Hall of Fame in several ways. First, we concentrate on the first election in which a player received votes to avoid a potential sample truncation problem. In their paper, Findlay and Reid use various measures of voting outcomes:

the vote ratio in the first year a player received votes; the highest vote ratio a player received; the vote ratio in the last year a player received votes; and whether a player ever received the votes necessary for induction. The sampling problem occurs because players who receive votes in successive elections (second election, third election, etc.) do not constitute a random sample of eligible players since they must survive previous elections.[1] Second, we utilize more extensive measures of race. Specifically, we distinguish between American-born black players and black players born in Latin American countries. Third, we examine the sensitivity of the estimates to specification changes by using an alternative estimation technique, by using a different measure of time, and by including additional measures of player performance. Fourth, we use our model to predict which players are most affected by race-based discrimination.

II. Data and Methodology

The data for this study consist of 291 non-pitchers (hitters) who were eligible for election into the Hall of Fame over the years 1962 to 1998. The sample includes 201 hitters who received votes and 90 hitters who appeared on a ballot but did not receive votes from 1962 to 1998. Information on voting rules and the total number of votes in annual elections are from the Hall of Fame's web page (www.baseballhalloffame.org). Each eligible player's name and number of votes received are from the *Total Baseball* web page, an online version of the official encyclopedia of MLB (www.totalbaseball.com). Players that were placed on ballots but did not receive votes (no-vote players) are found in various issues of *The Dallas Morning News*, *The New York Times*, *USA Today*, and *The Boston Globe*. Player statistics are collected from the *Total Baseball* web page.[2]

A player must have played in MLB for at least ten seasons, must have been retired for at least five years, and must have been an active player within 20 years of election to be considered

for election into the Hall of Fame by the BBWAA.[3] Eligible players must then be nominated by two of the six members of the BBWAA Screening Committee to be placed on the ballot in a given year. Players who are placed on the ballot must be named on 75 percent of the ballots returned by the writer-voters to enter the Hall of Fame. Voters must have been active as baseball writers and members of the BBWAA for at least ten years. Although the actual number is a closely guarded secret, there are over 500 voting members in the BBWAA, and voting is anonymous. Each year, the number and composition of voters varies. In addition, each writer is able to vote for up to 10 different players.

Since subjective measures such as integrity, sportsmanship, and character are difficult to measure, we assume that each writer casts a vote for each player based on that player's career performance statistics and other noteworthy accomplishments. In addition, a writer's vote may be partially influenced by the player's race. Let *i* represent voters and *j* represent players. A voter's evaluation of any player, $EVAL_{ij}$, is a continuous function of the career statistics and accomplishments of player *j* ($STATS_j$) and the race of player *j* ($RACE_j$). Assuming that $EVAL_{ij}$ is a linear function of $STATS_j$ and $RACE_j$ results in equation (1):

$$(1) \qquad EVAL_{ij} = STATS_j a_i + RACE_j b_i$$

where coefficients a_i and b_i are influenced by voter preferences. $EVAL_{ij}$ is unobserved; instead we observe a variable, $VOTE_{ij}$, equal to 1 or 0 (yes or no) based on the following voting rule:

$$(2) \qquad VOTE_{ij} = 1 \text{ if } EVAL_{ij} >= HOF_i$$

$$VOTE_{ij} = 0 \text{ if } EVAL_{ij} < HOF_i$$

where HOF_i is the voter *i* evaluation of the minimum level necessary for Hall of Fame status.

$VOTE_{ij}$ is a binary response (yes or no) for each voter. However, individual votes are unobserved in the voting data; instead, we observe the total number of "yes" votes each player

receives. Therefore, the observed dependent variable for each player is the percentage of votes received out of total votes (P_j).[4] This type of data is referred to as grouped or proportions data. Grouped-data models are normally estimated with maximum-likelihood techniques or with weighted least squares, the two methods being asymptotically equivalent. We employ the minimum logit chi-square method [Maddala (1983)] which consists of transforming the dependent variable to a logistic and applying weighted least squares to the following equation:

$$(3) \qquad \ln (P_j /1\text{-}P_j) = STATS_j a_i + RACE_j b_i + e_i$$

with weights equal to $(NP_j(1\text{-}P_j))^{½}$ where N equals total votes cast. The random error term is e_i. The logistic transformation is also discussed in Fox (1997) as a way to "linearize" the relationship between P_j and the dependent variables. A potential problem, however, is that for observations in which P_j is zero (i.e., no-vote players) the dependent variable cannot be transformed since the natural log of zero cannot be computed. This transformation problem is similar to sample selection and will be treated as such in our estimation as discussed below.

The vector $STATS_j$ contains player j's career performance measures: number of seasons played (*SEASONS*), hits (*HITS*), home runs (*HOMERS*), runs batted in (*RBIS*), batting average (*BATTING*), stolen bases (*STEALS*), Golden Glove Awards (*GOLD*), Most Valuable Player Awards (*MVP*), Rookie of the Year Award (*ROOKIE*), and World Series championship appearances (*WORLD*). The performance measures are expected to positively affect a voter's evaluation of each player, an increase in any of these measures raising the probability of any writer voting for a player. The Hall of Fame insists there are no accomplishments that guarantee entry. However, there are two achievements which, once reached, seem to ensure a player's induction: 3000 hits and 500 home runs. *3000HITS* and *500HRS* are included as measures of whether or not a player has achieved these statistical milestones. We include a dummy variable for players who

spent at least 10 percent of their careers in both leagues (*BOTH*). Spending time in both leagues may increase a player's visibility and, thus, his number of votes received. Alternatively, players who play in both leagues may be perceived negatively by writers who value loyalty to a single team. Dummy variables are also included for primary fielding position during a player's career (*FIRST, SECOND, THIRD, SHORT*, *CATCHER*). Fielding position measures control for visibility effects, with outfield being the excluded category. $STATS_j$ also includes squared terms for all relevant performance measures (e.g., $SEASONS^2$, $GOLD^2$, MVP^2, etc.) to control for any non-linearities in the effects of these variables.

The vector $RACE_j$ contains measures of a player's race. The variable *BLACK* equals one if a player's skin tone is perceived as "black" regardless of country of birth. In addition, the variable *LATIN*, equal to one for a player who was born in a Latin American country. However, *BLACK* and *LATIN* are not mutually exclusive, i.e., a player can be both black and born in a Latin American country. Therefore, an interaction variable, *BLACK*LATIN*, captures the effects of players who are both black and Latin. If raced-based discrimination is present, then these measures should be negatively correlated with votes.[5]

We include two measures of the effect of time on Hall of Fame voting. First, the year a player was placed on the ballot (*TIME*) is used as a linear time trend. *TIME* equals zero if the player's first vote was in 1962, equals one if the player's first vote was in 1963, and so forth. *TIME* is interacted with race measures to capture any effects of changes in race-based voting over time, and squared terms are included to control for non-linearities with respect to time. Second, we include dummy variables measuring the first year in which a player was on the ballot. Inclusion of these time categories allows us to estimate a fixed effect for each year.

Summary statistics for the entire sample are provided in Table One.[6]

{INSERT TABLE ONE}

Findlay and Reid use a two-stage estimation with Heckman's sample selection correction and White's heteroskedasticity correction. In the first stage, the authors address a potential sample selection problem due to the fact that some players on the ballot did not receive votes. This is not traditional sample selection, however, in the sense that we observe the dependent variable on players who did not receive votes, i.e., these players receive a "no" vote on every ballot. Therefore, a player receiving zero votes is a player whom all writers evaluate as undeserving of Hall of Fame status. If these players are fundamentally different from players who receive votes, and if the difference results from an unobservable component, then it is logical to treat no-vote players as having been selected out of the sample.[7] The second stage of Findlay and Reids' estimation corrects for heteroskedasticity introduced when transforming the dependent variable to a logit.

Our estimation method is different than that of Findlay and Reid, although we still employ Heckman's (1976) correction for sample selection to account for the no-vote players.[8] The first stage is a probit estimation of the determinants of a player receiving at least one vote. The independent variables in the first stage include all independent variables used in the second stage plus the exclusion restrictions discussed below. The second stage is the minimum logit chi-square estimation; we include only players who received votes and use weighted least squares to correct for heteroskedasticity. The inverse Mills ratio constructed from the first-stage estimates is included as a dependent variable in the second-stage. Findlay and Reid's second stage is similar to weighted least squares and, thus, allows for a comparison to our results.

In the Heckman two-stage model, the first-stage equation is theoretically identified due to its non-linear nature. The model is on firmer ground, however, if exclusion restrictions exist. We

include two variables in the first-stage that are excluded in the second stage. The first is a dummy variable equal to one if a player was a MLB manager prior to his Hall of Fame ballot. We expect this variable to be positively correlated with receiving at least one vote since MLB managers have greater visibility. The second is a dummy variable equal to one if a player spent over half of his playing career in the National League. We include this to indicate any exposure effect of National versus American League Players. Findlay and Reid, using similar exclusion restrictions, find evidence that white players are 19 percent more likely than black players to receive at least one vote. The results from our first-stage estimates are not presented in this paper. However, we note that when the effect of time is included in our first-stage estimation, we find no evidence that black players are less likely than other races to receive at least one vote. In addition, players who were managers are more likely to receive at least one vote in all first-stage specifications. Our first-stage estimates our available upon request.

III. Results

The Table Two estimates follow Findlay and Reid's specification with the following differences. First, we include dummies for all fielding positions; Findlay and Reid only control for middle infield positions. Second, Findlay and Reid use World Series games played; we were unable to locate these data for all players in our sample and instead use the number of years a player competed in the World Series. Third, we include *3000HITS*, *500HRS*, *RBIS*, *BATTING*, *MVP*, *ROOKIE*, and the squared terms as additional performance measures. Fourth, our sample includes players on ballots up to 1998, while Findlay and Reid's sample includes up to 1995. Fifth, we include a time dummy measuring the year of a player's first ballot and compare the results to those from a specification utilizing Findlay and Reid's linear time trend (*TIME*).

{INSERT TABLE TWO}

The specification in column A of Table Two includes *TIME* and is comparable to Findlay and Reid's specifications. We concentrate on the results with respect to the race measures. The positive coefficient on *BLACK* means that black players receive more votes than non-black players, everything else held constant, contradicting race-based discrimination against black players; Findlay and Reid find limited evidence of a significantly positive effect of *BLACK*, while we find no significance in this specification. Alternatively, *LATIN* is significant and negative, suggesting that players from Latin America are discriminated against. The sign on this coefficient is consistent with Findlay and Reid who find limited evidence of discrimination against Latin players. The negative coefficient on *BLACK*TIME* and the positive coefficient on *LATIN*TIME* are consistent with Findlay and Reid.

The negative coefficient on *TIME* indicates that players on the ballot in later years receive fewer votes; Findlay and Reid find a similar result, suggesting that voting standards have increased over time.[9] The coefficient signs on the performance statistics in Table Two are close to Findlay and Reid's, even with the different estimation technique and different independent variables. We note that much of the effect of the number of hits and the number of homers a player has is contained in the milestone variables *3000HITS* and *500HRS*. In addition, *GOLD*, *MVP*, and *ROOKIE* are highly significant. The inverse Mills ratio (*LAMBDA*) is included in the second stage estimates to account for potential sample selection. The coefficient is negative and significant. Findlay and Reid generally report positive coefficients on *LAMBDA*.

Column B of Table Two replaces Findlay and Reid's linear time trend with yearly time dummies and includes squared terms on performance measures and race/time interactions. Including each time period separately accounts for fixed time effects. Since the composition and

number of voters change each year, the time dummies may also control for unobserved differences in voters across years.[10] A major change from column A is that the coefficient on *LATIN* becomes insignificant, while the race/time interactions are significant in column B. In addition, the coefficient on *LAMBDA* becomes insignificant. Table Two reports the chi-square statistic from a Wald test restricting the race measures and race/time interaction terms in the relevant specification to be zero; we also report Wald tests for the specifications in Table Three.
The results indicate that the race variables are jointly significant in column B.

We also test the joint significance of the race measures and race/time interactions separated into black and Latin players. *BLACK*, *BLACK*TIME*, and $(BLACK*TIME)^2$ are jointly significant at the one percent level. The results indicate that black players are more likely to get votes in every year except 1998, all else constant. The Latin measures are jointly significant at the five percent level. The results indicate that Latin players are less likely to get votes from 1962 to 1972 and then are more likely to get votes from 1973 to 1998, all else constant. The specification reported in column C of Table Two excludes all race variables. A likelihood ratio test of specification B versus specification C suggests that inclusion of the race measures and race/time interactions improves the goodness-of-fit; the chi-square statistic is 31.51 with a critical value of 16.81 at $\alpha = 0.01$.

{INSERT TABLE THREE}

If discrimination exists in voting, we expect the effect to be compounded for players who are both black and Latin. To test for such an effect, column A of Table Three includes the dummy variable *BLACK*LATIN*. The coefficient is negative and significant, while the coefficients on *BLACK* and *LATIN* are insignificant. The coefficients on most of the race/time interaction terms are significant, and the race variables remain jointly significant. It appears that players who are

both black and Latin face greater voting discrimination than players who are either black or Latin. Most of the performance variables show the expected results, a positive first derivative and a negative second derivative. Interestingly however, *BATTING*, *STEALS*, and *SEASONS* have negative first derivatives and positive second derivatives. The results indicate that any increase in batting average decreases the number of votes for any player with an average less than 0.572, which is any player in our sample. Similarly, any player with less than 31 years experience sees a decrease in votes with another year of service, though no player in our sample had more than 23 years in MLB. For players who have more than 433 stolen bases (only 8 players in our sample do), another stolen base leads to more votes.

If voting has changed over time for all players of Latin American descent, then we might expect that voting has also changed for Latin American-born black players. As reported in column B of Table Three, the inclusion of *BLACK*LATIN*TIME* and its squared term results in all the race coefficients, except $(BLACK*TIME)^2$, being insignificant. However, the race measures and race/time interaction terms are jointly significant. In addition, adding these additional race/time interaction terms only marginally improves the goodness-of-fit; the chi-square statistic is 4.72, with a critical value of 4.61 at $\alpha = 0.10$. Finally, it can be argued that the performance-related award measures (*GOLD*, *MVP*, and *ROOKIE*) are biased since discrimination might have played a part in whether or not a player won these awards during his career. Therefore, we estimate a model excluding the award measures in column C of Table Three; the coefficients on all race measures are insignificant when dropping the award measures. Incorporating the award variables significantly improves the model's goodness-of-fit; the chi-square statistic is 95.30, with a critical value of 15.09 at $\alpha = 0.01$. However, improving the model's goodness-of-fit does not necessarily imply the absence of bias in the results from specifications including the award measures.

IV. Model Predictions

Tables Two and Three contain interesting results, but they provide no clue about the quantitative effects of any race-based voting on Hall of Fame voting outcomes. These results give some evidence that players who are black and were born in a Latin American country tend to receive fewer votes than other players. To examine the quantitative effects of discrimination, it is necessary to ascertain whether the actual vote tally for these players was affected. Using the results from column C of Table Two, we compute the predicted vote tally, as a percentage of the total vote, for each *BLACK*LATIN* player under the assumption that race plays no part in BBWAA voting. We then compare these results to the actual vote percentage received. Table Four presents the predicted outcomes in an alphabetical listing of *BLACK*LATIN* players.

{INSERT TABLE FOUR}

The *BLACK*LATIN* players are largely clustered at the lower end of the vote distribution (22 of these 26 players received less than 5 percent of the votes), and only Roberto Clemente received the votes necessary (75 percent) for election to the Hall of Fame. With the exception of Clemente, these players seem to have neither the actual votes nor the statistics to enter the Hall of Fame. The mean actual vote for this group is 7.13 percent (3.70 percent excluding Clemente), while the mean predicted vote is 8.88 percent (5.64 percent excluding Clemente). The player in this group most affected by any racial bias is Cesar Cedeno, whose actual vote was 0.47 percent but is predicted to receive 12.64 percent of the vote based solely on his statistics. A few of these *BLACK*LATIN* players actually received more votes than their statistics would predict. The most interesting example is Tony Perez, who received 50 percent of the vote but is predicted to receive only 39.84 percent. Although most of the players in this group should have received more votes

based on their statistics, racial bias in voting clearly did not keep these players from entering the Hall of Fame on their first ballot. However, racially-biased voting may not have allowed some players to the receive the 5 percent vote necessary to be on the next ballot (after 1981).

Next, we investigate the predicted outcomes for all players (regardless of race), looking for racial bias by comparing actual vote percentages to predicted vote percentages as discussed above. We do not report the predictions for all players here; the full set of predicted vote outcomes is available from the authors. We find that no players were left out of the Hall of Fame due to racial bias; specifically, there are no players for whom the predicted vote is greater than 75 percent and the actual vote is less than 75 percent. Racially-biased voting seems to have no negative effect on the first vote by the BBWAA in terms of which players actually get into the Hall of Fame.

However, we did find two players who were elected to the Hall of Fame and who had a predicted vote percentage of less than 75 percent: Jackie Robinson (actual vote = 77.70 percent; predicted vote = 63.70 percent) and Willie Stargell (actual vote = 82.44 percent; predicted vote = 72.42 percent). Both of these players are categorized as black in this paper. These players may have received votes based on accomplishments other than those in our data set. For instance, Jackie Robinson was, obviously, an important figure due to his breaking of the color line in baseball. Stargell may have entered the Hall of Fame based on his post-season performances or simply based on "integrity, sportsmanship, character, and contributions to the team(s) on which the player played." Nonetheless, it is clear that the race of these players did not preclude them from entry into the Hall of Fame on their first ballot.[11]

V. Conclusion

This paper extends recent research on the effects of race on player induction into the National Baseball Hall of Fame. We find limited evidence that players born in Latin American countries receive fewer votes on their first ballot, the results being sensitive to the estimation specification. For instance, including fixed time effects significantly changes the measured effect of race. In addition, we find that any discrimination against Latin players has lessened over time. We find little evidence of bias among voters against black players; however, discrimination in voting may exist for players who are both black and Latin. Finally, we show that race did not affect whether the players in our sample received enough votes to get into the Hall of Fame on the first ballot. Instead, any discrimination in voting is concentrated among those players who receive few votes and may not have the statistics to warrant entry into the Hall of Fame.

TABLE ONE
Summary Statistics
(N = 291)

Variable	Mean	Std. Dev.	Min.	Max.
Percentage Vote Received	0.0948	0.2362	0	0.9783
BLACK	0.3368	0.4734	0	1
LATIN	0.1134	0.3176	0	1
*BLACK*LATIN*	0.0893	0.2857	0	1
TIME	20.667	10.008	0	36
*BLACK*TIME*	8.0550	12.157	0	36
$(BLACK*TIME)^2$	212.16	354.70	0	1296
*LATIN*TIME*	2.5155	7.4775	0	36
$(LATIN*TIME)^2$	62.048	203.38	0	1296
*BLACK*LATIN*TIME*	1.9966	6.7172	0	36
$(BLACK*LATIN*TIME)^2$	48.952	181.15	0	1296

3000HITS	0.0275	0.1638	0	1
HITS	1608.7	643.79	237	3771
HITS^2/1000	3000.9	2266.2	56.169	14,220.44
500HOMERS	0.0378	0.1910	0	1
HOMERS	174.33	135.45	6	755
HOMERS^2/1000	48.673	74.273	0.036	570.025
RBIS	785.93	399.69	66	2297
RBIS^2/1000	776.89	764.67	4.356	5276.209
BATTING	0.2692	0.0216	0.193	0.344
BATTING^2	0.0729	0.0116	0.0372	0.1183
STEALS	95.189	120.67	0	938
STEALS^2/1000	23.572	75.423	0	879.844
FIRST	0.1409	0.3485	0	1
SECOND	0.1100	0.3134	0	1
THIRD	0.1237	0.3298	0	1
SHORT	0.0928	0.2906	0	1
CATCH	0.1271	0.3337	0	1
GOLD	1.1100	2.4792	0	16
GOLD^2	7.3574	25.145	0	256
MVP	0.1924	0.5292	0	3
MVP^2	0.3162	1.2076	0	9
ROY	0.0962	0.2954	0	1
WORLD	1.9588	2.0338	0	12
WORLD^2	7.9588	17.447	0	144
SEASONS	15.392	3.3184	10	24
SEASONS^2	247.88	105.14	100	576
BOTH	0.3780	0.4857	0	1

TABLE TWO

Weighted Least Squares Estimates with Heckman Correction (N = 201)
(Standard errors in parenthesis)

	A		B		C	
Constant	-5.5122*	(3.0298)	14.347	(11.688)	-29.382***	(12.008)
BLACK	0.8338	(0.5604)	0.6341	(0.6522)		
LATIN	-1.8416*	(1.0510)	-2.2841	(1.8488)		
*BLACK*TIME*	-0.0041	(0.0248)	-0.1693***	(0.0665)		
*(BLACK*TIME)^2*			0.0053***	(0.0016)		
*LATIN*TIME*	0.0668	(0.0451)	0.2858*	(0.1744)		
*(LATIN*TIME)^2*			-0.0060	(0.0039)		
TIME	-0.0258*	(0.0140)	(Not Reported)		(Not Reported)	
3000HITS	1.8567***	(0.4982)	2.5165***	(0.5759)	2.0128***	(0.5818)
HITS	0.0002	(0.0005)	0.0065***	(0.0019)	0.0055***	(0.0019)
HITS^2/1000			-0.0012***	(0.0004)	-0.0010**	(0.0004)
500HRS	1.1693***	(0.4142)	1.2860**	(0.5716)	1.7658***	(0.6047)
HOMERS	-0.0020	(0.0026)	0.0004	(0.0046)	-0.0017	(0.0047)
HOMERS^2/1000			0.0008	(0.0070)	-0.0016	(0.0074)
RBIS	0.0028**	(0.0013)	0.0024	(0.0031)	0.0045	(0.0032)
RBIS^2/1000			-0.0006	(0.0012)	-0.0011	(0.0013)
BATTING	-0.9497	(9.8672)	-133.79*	(78.015)	-219.54***	(81.603)
BATTING^2			227.12*	(137.78)	379.83	(144.07)
STEALS	0.0010	(0.0008)	-0.0011	(0.0019)	-0.0003	(0.0018)
STEALS^2/1000			0.0050**	(0.0024)	0.0041*	(0.0025)
FIRST	0.1084	(0.3020)	-0.2763	(0.2200)	-0.2331	(0.2207)

SECOND	0.5670	(0.4237)	0.0431	(0.3354)	0.0947	(0.3487)
THIRD	0.0426	(0.3913)	0.0656	(0.2746)	-0.0475	(0.2923)
SHORT	0.6879	(0.5283)	0.2359	(0.4494)	0.0493	(0.4826)
CATCHER	0.9321**	(0.4055)	1.3623***	(0.2804)	1.0739***	(0.2813)
GOLD	0.0830**	(0.0368)	0.1331**	(0.0659)	0.0688	(0.0647)
$GOLD^2$			0.0028	(0.0058)	0.0043	(0.0059)
MVP	0.6097***	(0.1555)	1.8111***	(0.3049)	1.4466***	(0.2909)
MVP^2			-0.4049***	(0.1229)	-0.2967***	(0.1153)
ROOKIE	0.5177*	(0.2773)	0.7867***	(0.2347)	0.8764***	(0.2353)
WORLD	0.0615	(0.0447)	0.0393	(0.0837)	0.1275	(0.0850)
$WORLD^2$			0.0037	(0.0082)	-0.0026	(0.0084)
SEASONS	0.0375	(0.0608)	-0.8642***	(0.2902)	-1.2464***	(0.2826)
$SEASONS^2$			0.0275***	(0.0084)	0.0382***	(0.0081)
BOTH	-0.4686*	(0.2751)	0.2074	(0.4965)	-0.0902	(0.1934)
LAMBDA	-1.8540**	(0.9300)	-0.5400	(0.4965)	-0.8216	(0.5445)
	$\chi^2(4) = 11.74$**		$\chi^2(6) = 25.70$***			
Log Likelihood	-278.8448		-156.6950		-172.4513	

*** significant at 1% level
** significant at 5% level
* significant at 10% level

TABLE THREE

Weighted Least Squares Estimates with Heckman Correction (N = 201)
(Standard errors in parenthesis)

	A		B		C	
Constant	14.721	(11.482)	15.287	(11.394)	56.238***	(13.322)
BLACK	0.5903	(0.6397)	0.4898	(0.6477)	-0.7849	(0.7580)
LATIN	-1.2170	(1.8511)	-2.6649	(3.9708)	-3.8846	(4.9220)
*BLACK*LATIN*	-1.7437***	(0.6355)	0.1439	(4.4935)	4.8078	(5.5378)
*BLACK*TIME*	-0.1282*	(0.0672)	-0.1072	(0.0693)	0.0654	(0.0823)
*(BLACK*TIME)^2*	0.0042***	(0.0016)	0.0036**	(0.0017)	-0.0009	(0.0020)
*LATIN*TIME*	0.3273*	(0.1718)	0.5257	(0.3759)	0.6056	(0.4637)
*(LATIN*TIME)^2*	-0.0072*	(0.0038)	-0.0124	(0.0081)	-0.0136	(0.0100)
*BLACK*LATIN* TIME*			-0.2735	(0.4232)	-0.6605	(0.5184)
*(BLACK*LATIN* TIME)^2*			0.0074	(0.0092)	0.0136	(0.0113)
TIME	(Not Reported)		(Not Reported)		(Not Reported)	
3000HITS	2.8669***	(0.5800)	2.9571***	(0.5882)	2.1249***	(0.6708)
HITS	0.0074***	(0.0019)	0.0075***	(0.0019)	0.0030	(0.0021)
HITS^2/1000	-0.0014***	(0.0004)	-0.0014***	(0.0004)	-0.0004	(0.0005)
500HRS	1.3188**	(0.5628)	1.3644**	(0.5614)	1.7491***	(0.6864)
HOMERS	0.0023	(0.0045)	0.0018	(0.0045)	-0.0051	(0.0053)
HOMERS^2/1000	-0.0003	(0.0069)	0.0001	(0.0068)	0.0093	(0.0080)
RBIS	0.0009	(0.0031)	0.0010	(0.0030)	0.0111***	(0.0035)
RBIS^2/1000	-0.0003	(0.0012)	-0.0004	(0.0012)	-0.0039***	(0.0014)
BATTING	-140.27*	(76.485)	-143.60*	(75.839)	-380.75***	(89.923)
BATTING^2	244.96*	(135.13)	248.72*	(133.91)	691.56***	(157.38)

STEALS	-0.0026	(0.0019)	-0.0024	(0.0020)	-0.0002	(0.0023)
STEALS^2/1000	0.0060**	(0.0025)	0.0056**	(0.0025)	0.0032	(0.0030)
FIRST	-0.1850	(0.2186)	-0.2181	(0.2215)	-0.0451	(0.2620)
SECOND	0.0876	(0.3301)	0.0337	(0.3344)	0.5570	(0.3921)
THIRD	0.0183	(0.2693)	0.0054	(0.2675)	-0.1221	(0.3157)
SHORT	0.2533	(0.4411)	0.1231	(0.4664)	0.5671	(0.5260)
CATCHER	1.3550***	(0.2750)	1.3315***	(0.2739)	1.4951***	(0.3234)
GOLD	0.1147*	(0.0651)	0.1017	(0.0654)		
GOLD^2	0.0048	(0.0057)	0.0056	(0.0057)		
MVP	1.6502***	(0.3063)	1.6820***	(0.3126)		
MVP^2	-0.3409***	(0.1232)	-0.3437***	(0.1239)		
ROOKIE	0.7486***	(0.2312)	0.7215***	(0.2310)		
WORLD	0.0997	(0.0851)	0.1119	(0.0852)	0.3359***	(0.0915)
WORLD^2	-0.0014	(0.0082)	-0.0026	(0.0082)	-0.0135*	(0.0081)
SEASONS	-0.9009***	(0.2857)	-0.8894***	(0.2886)	-2.0690***	(0.3234)
SEASONS^2	0.0290***	(0.0083)	0.0283***	(0.0084)	0.0597***	(0.0094)
BOTH	0.3047	(0.1986)	0.2743	(0.1987)	-0.2176	(0.2240)
LAMBDA	-0.4012	(0.4771)	-0.5337	(0.4748)	-1.1381**	(0.5716)
	$\chi^2(7) = 33.89$***		$\chi^2(9) = 35.05$***		$\chi^2(9) = 14.00$	
Log Likelihood	-152.6634		-150.3034		-197.9546	

*** significant at 1% level
** significant at 5% level
* significant at 10% level

TABLE FOUR
Predicted Outcomes for *BLACK*LATIN* Players

Name	Actual Vote	Predicted Vote	Difference
F. Alou	0.78%	1.44%	0.66%
J. Alou	0.25%	0.02%	-0.23%
M. Alou	1.30%	0.47%	-0.83%
B. Campaneris	3.13%	14.88%	11.74%
J. Cardinal	0.24%	1.33%	1.10%
L. Cardenas	0.25%	0.60%	0.35%
R. Carty	0.25%	0.33%	0.07%
P. Casanova	0.00%	0.28%	0.28%
C. Cedeno	0.47%	12.64%	12.17%
O. Cepeda	12.47%	23.93%	11.47%
H. Clarke	0.00%	0.58%	0.58%
R. Clemente	92.69%	89.83%	-2.86%
C. Geronimo	0.00%	0.11%	0.11%
P. Guerrero	1.27%	1.51%	0.24%
M. Minoso	1.77%	10.69%	8.93%
W. Montanez	0.00%	8.44%	8.44%
J. Morales	0.00%	0.00%	0.00%
M. Mota	4.22%	2.49%	-1.73%
I. Murrell	0.00%	0.01%	0.01%
B. Oglivie	0.00%	2.90%	2.90%
T. Oliva	15.18%	10.94%	-4.24%
T. Perez	50.00%	39.84%	-10.16%
V. Power	0.56%	1.27%	0.71%
M. Sanguillen	0.47%	1.39%	0.92%
C. Tovar	0.00%	2.33%	2.33%
M. Trillo	0.00%	2.66%	2.66%
Mean	7.13%	8.88%	1.75%

ENDNOTES

1.) Players are removed from the sample in several (non-random) ways. For instance, the best players will be removed from the sample due to induction into the Hall of Fame. Also, beginning in 1981, a player must receive five percent of the vote to be placed on the next year's ballot.

2.) The sample excludes the no-vote players for the years 1962, 1964, and 1966 since these names were unavailable. In addition, Pete Rose is excluded from the sample; Rose was on the ballot first in 1992, when he received 42 votes (9.74 percent). He never received votes commensurate with his on-the-field accomplishments, possibly due to his gambling and legal problems. The initial year 1962 is chosen since this is the first year a player of African ancestry, Jackie Robinson, was eligible for election.

3.) Players who are retired for at least 23 years are eligible for election by the Committee on Baseball Veterans.

4.) Data on the votes of individual voters are not made available by the BBWAA. Therefore, we can make no statements about the race-based preferences of writer-voters.

5.) We use the baseball cards pictured in Slocum and Foley (1990) to categorize the black players. For Latin American players, we use the place of birth listed by *Total Baseball*. We make the following comments with respect to the categorization of players. First, *LATIN* includes two players born in the Virgin Islands (Jose Morales and Horace Clark); we also estimate a voting model categorizing these two players as non-*LATIN* with no significant differences from the results presented in this paper. Second, Rod Carew is categorized as non-*LATIN*, since he was born in the Panama Canal Zone, which was an American Protectorate at the time of his birth. The voting model is also estimated categorizing Carew as *LATIN*; this estimation results in smaller coefficients on *LATIN* and *BLACK*LATIN*. Third, we estimate a model in which *LATIN* equaled

one if a player had an Hispanic surname regardless of birthplace. The results from this estimation are not significantly different from those presented in this paper. Fourth, there is some difficulty in determining whether or not to categorize some players as *BLACK*. We re-estimate the model with and without the players who could be categorized as either *BLACK* or non-*BLACK*. In a few cases (i.e., Orlando Cepeda and Tony Perez) the results are significantly affected by the categorization. However, the coefficient on *BLACK*LATIN* is consistently significant in all re-estimations of the specification reported in column A of Table Two, although the magnitude of the coefficient does change. All of the estimates commented on in this footnote are available from the authors. A complete list of players by race is given in the Appendix.

6.) Hall of Fame voting took place in each year from 1962 to 1998 except 1963 and 1965. The coefficients on the time categories are not reported for the sake of brevity. These results are available from the authors.

7.) Another sample selection issue addressed in an unpublished manuscript (Dresser, Monks, and Robinson, 1998) involves the procedure by which players are nominated and placed on the ballot each year. Neither our paper nor Findlay and Reid's deal with this issue. Thus, the results presented here, and those presented by Findlay and Reid, are effectively conditional on being nominated and placed on the ballot.

8.) The Heckman correction is performed using LIMDEP. The estimation is based on method of moments and is discussed in detail in Greene (1981). This method produces a likelihood function value, reported in Tables Two and Three, that can be used to test goodness-of-fit.

9.) The coefficient on *TIME* is reported as positive in Table 2.2 in Findlay and Reid's paper; however, Dave Findlay assures us that this is a typographical error and that the sign is negative.

10.) We retain the race/linear time trend interaction terms as dependent variables. Constructing a race/time interaction term for each year is problematic due to insufficient variation in *BLACK* and *LATIN* across years.

11.) Using a logit, we re-estimate the specifications in Tables One and Two with a dependent variable equal to one if the player was ever elected into the Hall of Fame. The logit model does not run with the full set of independent variables, and the results are highly sensitive to the independent variables included. The only consistent result is that Black players are more likely to be inducted than non-black players. This result is not surprising given the predicted voting results discussed above. These results are available from the authors. Findlay and Reid attempt a similar logit estimation, finding no significant effect of race on Hall of Fame induction.

APPENDIX
Race Categories for All Players

Name	*BLACK*	*LATIN*
Hank Aaron	1	0
Bobby Adams	0	0
Dick Allen	1	0
Felipe Alou	1	1
Jesus Alou	1	1
Matty Alou	1	1
Luis Aparicio	0	1
Richie Ashburn	0	0
Bob Bailey	0	0
Bob Bailor	0	0
Dusty Baker	1	0
Sal Bando	0	0
Ernie Banks	1	0
Bob Barton	0	0
Don Baylor	1	0
Hank Bauer	0	0
Glenn Beckert	0	0
Mark Belanger	0	0
Buddy Bell	0	0
Johnny Bench	0	0
Yogi Berra	0	0
Ken Berry	0	0
Paul Blair	1	0
John Boccabella	0	0
Bobby Bonds	1	0
Bob Boone	0	0
Larry Bowa	0	0
Clete Boyer	0	0
Ken Boyer	0	0
Rocky Bridges	0	0
John Briggs	1	0
Lou Brock	1	0
Gates Brown	1	0
Larry Brown	0	0
Bill Bruton	1	0
Bill Buckner	0	0
Al Bumbry	1	0
Smoky Burgess	0	0
Rick Burleson	0	0
Jeff Burroughs	0	0
Johnny Callison	0	0
Roy Campanella	1	0
Bert Campaneris	1	1
Chris Cannizzaro	0	0
Jose Cardenal	1	1
Leo Cardenas	1	1
Rod Carew	1	0
Chico Carrasquel	0	1
Name	***BLACK***	***LATIN***
Gary Carter	0	0
Rico Carty	1	1
Paul Casanova	1	1
Dave Cash	1	0
Norm Cash	0	0
Phil Cavaretta	0	0
Cesar Cedeno	1	1
Orlando Cepeda	1	1
Ron Cey	0	0
Chris Chambliss	1	0
Jack Clark	0	0
Horace Clarke	1	1
Roberto Clemente	1	1
Rocky Colavito	0	0
Dave Concepcion	0	1
Cecil Cooper	1	0
Walker Cooper	0	0
Clint Courtney	0	0
Del Crandall	0	0
Terry Crowley	0	0
Jose Cruz	0	1
Alvin Dark	0	0
Rich Dauer	0	0
Vic Davalillo	0	1
Tommy Davis	1	0
Doug DeCinces	0	0
Joe DeMaestri	0	0
Rick Dempsey	0	0
Bucky Dent	0	0
Larry Doby	1	0
Brian Downing	0	0
Walt Dropo	0	0
Johnny Edwards	0	0
Del Ennis	0	0
Darrell Evans	0	0
Dwight Evans	0	0
Ron Fairly	0	0
Joe Ferguson	0	0
Curt Flood	1	0
George Foster	1	0
Nellie Fox	0	0
Bill Freehan	0	0
Jim Fregosi	0	0
Carl Furillo	0	0
Phil Gagliano	0	0
Augie Galan	0	0
Oscar Gamble	1	0
Phil Garner	0	0
Name	***BLACK***	***LATIN***
Steve Garvey	0	0
Cesar Geronimo	1	1
Jim Gosger	0	0
Dick Green	0	0
Bobby Grich	0	0
Ken Griffey	1	0
Dick Groat	0	0
Greg Gross	0	0
Jerry Grote	0	0
Pedro Guerrero	1	1
Mike Hargrove	0	0
Tommy Harper	1	0
Toby Harrah	0	0
Bud Harrelson	0	0
Jim Ray Hart	1	0
Grady Hatton	0	0
Richie Hebner	0	0
Jim Hegan	0	0
Tommy Helms	0	0
Solly Hemus	0	0
George Hendrick	1	0
Keith Hernandez	0	0
Jim Hickman	0	0
Larry Hisle	1	0
Gil Hodges	0	0
Bob Horner	0	0
Willie Horton	1	0
Frank House	0	0
Elston Howard	1	0
Frank Howard	0	0
Art Howe	0	0
Roy Howell	0	0
Randy Hundley	0	0
Ron Hunt	0	0
Reggie Jackson	1	0
Sonny Jackson	1	0
Jackie Jensen	0	0
Alex Johnson	1	0
Dave Johnson	0	0
Deron Johnson	0	0
Cleon Jones	1	0
Willie Jones	0	0
Mike Jorgensen	0	0
Al Kaline	0	0
George Kell	0	0
John Kennedy	0	0
Terry Kennedy	0	0
Don Kessinger	0	0
Name	***BLACK***	***LATIN***
Harmon Killebrew	0	0
Ralph Kiner	0	0

Dave Kingman	0	0	Joe Morgan	1	0	Red Schoendienst	0	0
Ted Kluszewski	0	0	Manny Mota	1	1	Tony Scott	1	0
Ray Knight	0	0	Thurman Munson	0	0	Roy Sievers	0	0
Andy Kosco	0	0	Bobby Murcer	0	0	Ted Simmons	0	0
Ed Kranepool	0	0	Ivan Murrell	1	1	Duke Sims	0	0
Harvey Kuenn	0	0	Stan Musial	0	0	Ken Singleton	1	0
Hal Lanier	0	0	Graig Nettles	0	0	Enos Slaughter	0	0
Carney Lansford	0	0	Ron Northey	0	0	Roy Smalley	0	0
Chet Lemon	1	0	Jim Northrup	0	0	Reggie Smith	1	0
Jeffrey Leonard	1	0	Ben Oglivie	1	1	Duke Snider	0	0
Whitey Lockman	0	0	Tony Oliva	1	1	Chris Speier	0	0
Davey Lopes	0	0	Al Oliver	1	0	Jim Spencer	0	0
John Lowenstein	0	0	Amos Otis	1	0	Mickey Stanley	0	0
Greg Luzinski	0	0	Andy Pafko	0	0	Willie Stargell	1	0
Fred Lynn	0	0	Dave Parker	1	0	Rusty Staub	0	0
Garry Maddox	1	0	Larry Parrish	0	0	John Stearns	0	0
Bill Madlock	1	0	Tony Perez	1	1	Champ Summers	0	0
Mickey Mantle	0	0	Rico Petrocelli	0	0	Jim Sundberg	0	0
Roger Maris	0	0	Lou Piniella	0	0	Garry Templeton	1	0
Billy Martin	0	0	Vada Pinson	1	0	Gene Tenace	0	0
Eddie Mathews	0	0	Darrell Porter	0	0	Gorman Thomas	0	0
Gary Matthews	1	0	Boog Powell	0	0	Bobby Thomson	0	0
Dal Maxvill	0	0	Vic Power	1	1	Andre Thornton	1	0
Carlos May	1	0	Terry Puhl	0	0	Bobby Tolan	1	0
Lee May	1	0	Doug Rader	0	0	Earl Torgeson	0	0
John Mayberry	1	0	Willie Randolph	1	0	Joe Torre	0	0
Willie Mays	1	0	Johnny Ray	1	0	Cesar Tovar	1	1
Bill Mazeroski	0	0	Rick Reichardt	0	0	Manny Trillo	1	1
Dick McAuliffe	0	0	Pee Wee Reese	0	0	Del Unser	0	0
Bake McBride	1	0	Ken Reitz	0	0	Ellis Valentine	1	0
Tim McCarver	0	0	Jerry Remy	0	0	Elmer Valo	0	0
Willie McCovey	1	0	Del Rice	0	0	Mickey Vernon	0	0
Gil McDougald	0	0	Jim Rice	1	0	Bill Virdon	0	0
Roy McMillan	0	0	Bobby Richardson	0	0	Dixie Walker	0	0
Ken McMullen	0	0	Jim Rivera	0	0	Claudell Washington	1	0
Hal McRae	1	0	Bill Robinson	1	0	John Wathan	0	0
Bill Melton	0	0	Brooks Robinson	0	0	Bob Watson	1	0
Denis Menke	0	0	Frank Robinson	1	0	Vic Wertz	0	0
Eddie Miksis	0	0	Jackie Robinson	1	0	Wes Westrum	0	0
Felix Millan	0	1	Cookie Rojas	0	1	Frank White	1	0
Norm Miller	0	0	Joe Rudi	0	0	Roy White	1	0
John Milner	1	0	Bill Russell	0	0	Billy Williams	1	0
Minnie Minoso	1	1	Mike Ryan	0	0	Ted Williams	0	0
Rick Monday	0	0	Manny Sanguillen	1	1	Maury Wills	1	0
Don Money	0	0	Ron Santo	0	0	Jim Wynn	1	0
Willie Montanez	1	1	Hank Sauer	0	0	Carl Yastrzemski	0	0
Wally Moon	0	0	Paul Schaal	0	0	Steve Yeager	0	0
Name	***BLACK***	***LATIN***	Mike Schmidt	0	0	Rudy York	0	0
Jose Morales	1	1	**Name**	***BLACK***	***LATIN***	Richie Zisk	0	0

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