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ABSTRACT

The selection process of the most valuable player (MVP) in the National Basketball Association (NBA) was recently questioned as to whether African-American players were treated unfairly based on their race. Using NBA voting data from the 1995-2005 seasons, we develop two empirical models in order to examine the role that a player's race plays in the determination of this award. Our estimates imply that after controlling for player, team, and market characteristics, there is no statistically significant effect of race on the likelihood that a player will appear on an MVP ballot or on the number of votes he will receive.

Keywords: Discrimination, Basketball, Tobit, Probit

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I. Introduction

In each of the major professional sports leagues in the United States, the league honors one participant with an award signifying that player as being the league's "most valuable." While the specific means of determining most valuable players varies across leagues, the media usually plays some role in the anointment of the league's top player. The set of attributes associated with the player deemed "most valuable" is open to some debate and, as such, the announcement of the recipient is often accompanied with controversy. Some claim that the award recognizes the best player on the best team, while others would argue that the award recipient should be the best player in the league regardless of team standings and performance. Even issues related to race and market size often are debated by those seeking to gain an understanding of the factors that influence voting outcomes. In this article, an empirical model is developed to help shed light on the factors associated with the determination of the National Basketball Association (NBA) Most Valuable Player award. Particular emphasis will be placed on the role of the race of the athlete in modeling the voting behavior of media participants.

The NBA's most valuable player (MVP) award is named in honor of the league's first commissioner, Maurice Podoloff. The winner of the Podoloff trophy is determined after a panel of members of the basketball media cast ballots. The size of the panel varies from year to year; between 1992 and 2006 (inclusive) the panel size ranged from 96 voters (in 1992) to as many as 127 (in 2005). In 2006, the number of voters was 125, with three members from each of the 30 NBA cities, and the remainder being a mix of national writers and broadcasters (McNeal, 2006).

Each voter provides his/her ranking of the top five players in the league when casting a ballot each year, which is submitted before the start of the post-season playoffs (McNeal, 2006).

The points awarded to each player for the award are inversely related to the ranking received. A first place vote is awarded 10 points, a second place vote seven points, a third place vote five points, a fourth place vote three points, and a fifth place vote is awarded one point (NBA.com, 2006). The number of MVP voting points received by any player in a given year is simply the sum of these points and the player with the most points is declared the winner. The maximum number of points any one player can receive is 10 times the number of voters (which would be the result if all voters assigned first place to the same player.) After aggregating vote totals, the player with the most points is given the award.

The player designated as the league's best benefits in various ways. Contracts may include clauses which call for specific bonuses should a player be named MVP or even if the player is significantly recognized in the voting process. Indirectly, the receipt of such honors likely increases player expectations over future earnings.

Steve Nash, the point guard for the Phoenix Suns, first laid claim to the MVP award in 2005. In winning this award, Nash, who is white, edged Miami Heat center Shaquille O'Neal, who is African-American, in a very close race. Almost immediately after the MVP was announced, discussions about the role of race in the determination of the award commenced. Dan Le Batard of the Miami Herald, the hometown newspaper of runner-up Shaquille O'Neal, was one of the first to launch the debate:

> "*No one who looks or plays like Steve Nash has ever been basketball's MVP. Ever. In the history of the award, a tiny, one-dimensional point guard who plays no defense and averages fewer than 16 points a game never has won it. But Nash just stole Shaquille O'Neal's trophy, even though O'Neal had much better numbers than Nash in just about every individual statistical measurement except assists, so it begs the question: Is this as black and white as the box-scores that usually decide these things?*"
>
> *Le Batard (2005)*

The primary purpose of this paper is to attempt to answer the question of whether race has played a role in the determination of the NBA's MVP award. We also investigate the primary determinants of winning the award and evaluate whether some of those measures are correlated with a player's race. We examine historical data on voting outcomes, player characteristics, player and team performance measures and market information over 11 seasons, from 1994-1995 through 2004-2005, to develop models of voting behavior. We then use these models to assess whether race has been related to MVP voting behavior.

II. Literature Review

Questions regarding the role of racial discrimination in professional sports are not new in academe. In labor markets, Becker (1957) demonstrates that discriminatory behavior in hiring practices would be inefficient under competitive pressure because qualified applicants would be passed over in favor of less qualified applicants. Testing this notion, Gwartney and Haworth (1974) found a positive relationship existed between the number of black players on rosters and number of games won for all teams between 1950 and 1959, and used this evidence to support their claim of labor market discrimination. Hannsen (1998) examines, using data from the early 1950's to present, the relationship between the extent of black player representation on Major League Baseball (MLB) rosters and firm performance and also finds results consistent with Becker's model. Specifically, teams with above average minority representation had experienced above average firm performance at the expense of firms with lower minority representation. The magnitude of this effect is shown to diminish over time with increased integration of minority ballplayers.

Therefore, it would appear that overt racial discrimination is not a rational strategy for professional sports owners. Because of the adverse impact of discriminatory behavior on rents, economists generally agree that the persistence of racial discrimination in labor markets is not likely in the absence of customer discrimination. Customers must generally be willing to pay the premium associated with the otherwise inefficient use of resources associated with discrimination for such practices to persist. In considering the behavior of NBA MVP voting media, one might make the argument that incentives may exist for members of the media to vote in a manner consistent with the wishes and preferences of their consumers. In this case, newspaper subscribers and television viewers interested in matters related to the NBA represent the consumer base.

From the perspective of customer discrimination, Nardinelli and Simon (1990) examine baseball memorabilia markets to determine if the race of the athlete associated with the memorabilia is a significant determinant of price. Using limited dependent variable techniques, the authors determine that the price of baseball cards is influenced by the race of the athlete featured on the card. Ceteris paribus, the cards for white baseball players cost more than the cards for black athletes. Stone and Warren (1997) examine the market value of basketball trading cards, however, and find limited evidence that race significantly impacts card prices. In Major League Baseball, votes cast by fans are used to determine the starting lineups for Major League Baseball's All-Star Game. Hannsen and Andersen (1999) examine the vote totals for individual players during each season between 1970-1996 seeking evidence of customer discrimination. Using techniques appropriate for the problem of dependent variable data truncation, the authors find that All-Star voting discrimination against black baseball players has not only diminished from 1970 to 1996, but has almost reversed.

The impact of race in professional sports has not been limited to studies involving Major League Baseball. Kanazawa and Funk (2001) examine Nielson ratings and find that televised NBA games receive higher ratings, ceteris paribus, when a larger proportion of white athletes are participating. In effect, this increases the marginal revenue product of the white athlete since higher television ratings are associated with higher advertising revenues. Such findings may help to explain the numerous studies that find that there is some evidence of wage discrimination in professional basketball. For example, Kahn and Sherer (1988) examined data from the mid-1980's and found, after controlling for various productivity measures, that white players were paid a premium.[1] Hamilton (1997), in an effort to determine if the premiums persisted into the 1990's, examined 1994-1995 season data and determined that no statistically significant relationship existed between salaries of white and black players. However, isolating salaries in the top end of the distribution, the author concluded that there was an 18 percent premium for white players, indicative of a "form of customer discrimination in which sports fans prefer to see white stars, all else equal." Kahn and Shah (2005) continued this line of research and found that discrimination is still evident against "marginal nonwhite players." In this piece, they concluded that no evidence of salary discrimination exists among players who are recent free agents or earn salaries that might be affected by rookie salary caps. McCormick and Tollison (2001) argue that evidence of a white-black wage gap in NBA compensation levels might reflect something other than customer discrimination. If black players have lower earning potential outside of the basketball and NBA teams hire in a monopsonistic environment, earnings of black players will likely be lower.

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[1] While evidence of salary differentials was uncovered, Kahn and Sherer (1988) determined that race did not significantly impact the order in which players were drafted.

The rationale for the existence of such premiums might be explained by the work of Burdekin and Idson (1991). They identified an inverse relationship between the number of black players on rosters and the attendance and revenues of NBA clubs for the time period between 1980 and 1986. Interestingly, no significant relationship between these variables was detected between 1969 and 1982. Kahn (1991) suggests that such a result may be the result of a relative paucity of white players in the latter time period. As white players became increasingly scarce across time, the discriminating customer might value their presence, at the margin, at a higher level. Hoang and Rascher (1999) examined data from the 1980's and found that the increased presence of white players on the roster (relative to the white population in the city) was associated with increased attendance. Brown, Spiro and Keenan (1991) have demonstrated that a better match between the racial composition of the roster and the racial composition of the city in which the team played its home games was significantly related to attendance levels (Brown, Spiro and Keenan, 1991). Burdekin, Hossfeld, and Smith (2005) examine whether this phenomenon persisted in the 1990's. They concluded that, ceteris paribus, revenues of NBA teams with a disproportionately large share of white players were higher in areas with a relatively large white fan base.

Empirical efforts focused on the behavior of media casting hall of fame ballots in professional athletics provide a more meaningful framework for the development of our current analysis. In examining MLB Hall of Fame voting behavior of media, Findlay and Reid (1997) employ Heckman's two-step procedure to find that the probability that a black player will ever receive a single all-star vote is significantly lower when compared to a similarly situated white player. In the second stage of the procedure, the authors further demonstrate that the total number of Hall of Fame votes cast is sometimes a function of, among other things, race or ethnicity. This provides some evidence that historical discrimination exists among media members who cast Hall of Fame ballots. However, this voting process is distinct from the NBA's process in a critical way. Baseball's Hall of Fame selection procedures are by construction a two-step procedure, in which those appearing on the final ballot are first screened from a larger group of eligible players.[2] In contrast, the media members who vote for the NBA's most valuable player each season provide their top choices on a single ballot, and the player who receives the most points is anointed the winner.

III. Empirical Model and Data

Our focus now turns to the development of an empirical model to address the impact of race on the behavior of NBA MVP voters. Because no guidelines are provided by the NBA to assist in establishing criteria for voting, we assume that the likelihood of receiving votes is largely a function of player and team performance measures; it is possible that other factors, such as the market (city) of the player's team as well as other non-performance related factors, including a player's race, may also impact whether a player receives votes. That is, voters are assumed to consider a number of factors when making this decision, such as a vector of player-specific performance measures ($Player_j$), a vector of player *j*'s team-specific performance measures ($Team_j$), a vector of other factors such as market size and location pertaining to the player's team ($Market_j$), and a vector of player characteristics that in theory are not accounted for in the typical measures of on-court production ($Char_j$). Included among those non-productivity related measures would be the race of player *j*.

We assume that voters will evaluate all current NBA players when deciding which one is the most valuable. That is, the voters assign an unobserved MVP rating or "index" to every

[2] The specific Hall of Fame voting procedures can be found at http://www.baseballwriters.org/HOF_rules.html

player, but since only the top five players on these indices appear on the voter(s) ballots, the realization of the MVP index is only observed for a subset of players, specifically those receiving MVP votes. The Tobit model is appropriate in cases where the dependent (latent) variable is not always observed. More formally:

$Votes_j = \lambda X_j + \varepsilon_j$ if $\lambda X_j + \varepsilon_j > MVP^*$

And

$Votes_j = 0$ if $\lambda X_j + \varepsilon_j <= MVP^*$ (Equation 1)

Where MVP* represents the threshold for including a player on an MVP ballot (i.e., ranking among the top five according to a voter's MVP index) and λX_j is the full vector of player, team, market and other player characteristics.[3]

An alternative possibility of whether a player's MVP chances are affected by his race can be investigated by examining whether a player's race affects the probability he will receive any MVP votes, i.e., the player will not appear among the top 5 players on an MVP ballot. That is, the alleged discrimination may manifest itself when a voter has to identify the handful of potentially most valuable players each year, but not necessarily when it comes to ranking those same players on the MVP ballot, the composition of which is already affected by discrimination. More formally, the probability that a voter will place player *j* on his/her MVP ballot is determined by the same vectors of player, team, market and personal characteristics described in Equation 1:

$Prob(Z_j = 1) = \Phi(\beta\ Player_j + \gamma\ Team_j + \delta\ Market_j + \theta\ Char_j + \varepsilon_j)$ (Equation 2)

The data used for the analysis were pulled from various sources. We collected MVP vote totals for all 188 players receiving MVP votes between the seasons ending in 1995 and 2005,

[3] That is, i.e., $\lambda X_j = \alpha + Player_j + \gamma\ Team_j + \delta\ Market_j + \theta\ Char_j$.

inclusive.[4] These seasons encompassed the controversial selection of Steve Nash in 2005, as well as the ten preceding seasons. Each observation in the dataset represented a player-season. For example, a player who participated in all 11 seasons during this time period was represented with 11 separate observations. For each player in a given year, the total number of MVP voting points was recorded. As previously mentioned, in MVP voting, points are assigned to each cast vote (10 points for a first-place vote, 7 for a second-place vote, etc.). The number of MVP voting points received (and observed in the data) by any player in a given year is simply the sum of these points.

In addition to the 188 MVP vote-getters across these 11 seasons, we also included observations for another 2,992 players that did not receive any MVP votes in each respective season. The additional observations are for those players who rank among the top ten in scoring on their respective teams in each respective season, as we deemed it highly unlikely that any player not ranking in the top ten on his own team would be under consideration by MVP voters (no such player has ever received MVP votes, much less won the award.) These selection criteria generated a total sample size of 3,180 player-seasons in the NBA during the relevant time period.

For each player included in the analysis, we collected the vector of individual performance data ($Player_j$) from www.databasebasketball.com.[5] This rather exhaustive set of data included a host of individual performance information including the position of the player, minutes played, points scored, rebounds, blocked shots, steals, assists, turnovers, field goals, and personal fouls, among others. We converted all player performance data into per-game values. One reason for doing so was that per-game data are widely reported in the media and followed

[4] An NBA season crosses a calendar year. Within this paper, the term “1995 season,” for example, refers to the season beginning in 1994 and ending in 1995.
[5] At the time we collected the data, this site was named www.basketball-reference.com.

by fans (and presumably voters). Moreover, doing so also allowed us to control for the effects of the 1998-1999 strike year, in which only 50 games were played, meaning that any player data represented as a season total would have otherwise been adversely affected.

We also made an additional conversion to the player performance data to better reflect the comparison of players within each season. We converted each player's game performance data into a difference between that player's per-game statistic and the corresponding best value in the league for that particular season. For example, if player A averaged 20 points per game in a given year, and the leading scorer in the league that same year averaged 28 points per game, player A's points per game value was converted to 20 – 28 = -8. Nearly all game performance statistics were constructed such that a higher value was better (e.g., points scored per game, rebounds per game, etc.). Thus, our computations meant that nearly all performance statistics (e.g., points per game) in a given year had a maximum value of zero (for the player who had the best such value in the league for that year), and a negative value for all other players in that same year.[6] Such a simple transformation allowed for the variable described above, for example, to be interpreted as "points per game behind the league leader." Also, converting the variables to a difference between a specific player and a league leader in that year allows us to combine the data from 11 distinct years into a single database. That is, any annual differences in (average) performance are effectively eliminated with this conversion. Put another way, this method treats a player who scored 5 points less per game than the league leader in 1995 the same as a player

[6] Similarly, for performance measures such as turnovers and personal fouls in which higher values are associated with poorer performance, we constructed the difference such that an increase in this value was "better." That is, a specific player's value of these variables was subtracted from the league minimum in that particular season.

who scored 5 points less per game than the league leader in 2005, even if the league leader in 2005 averaged 30 points per game and the league leader in 1995 averaged 20 points per game.[7]

We collected the vector of yearly team performance information ($Team_j$) also from www.databasebasketball.com, specifically team wins and playoff appearances in each year. Using this information, we created a binary variable representing whether a player's team made the playoffs, a variable representing if his team had the best record in the league in the respective year, a measure of the change in his team's wins versus the previous year, and another variable representing the difference between his team's wins and the top number of wins in the league that year.[8]

To compute the vector of information associated with teams' markets ($Market_j$), we collected the size of the television market in each NBA city from Neilson ratings. These included the national rank of the television market, and the number of households with televisions in those markets. We also constructed binary variables reflecting whether the player's team was in an "east coast" market (i.e., New York/New Jersey, Boston, Philadelphia, or Washington), in a "large" market (quantified as the aforementioned four markets, plus Atlanta, Chicago, Dallas, Los Angeles, and San Francisco), and whether the player's team competed in the Eastern Conference of the NBA. All of these factors were hypothesized to have potential effects on voting due to the preponderance of NBA cities along the east coast, because night games from west coast markets suffer from less overall television and other media

[7] Besides measures of blocked shots and steals, there are few measures of a player's defensive prowess. However, voters may also ignore such information when selecting the MVP. In the 11 years encompassed by our sample, the NBA's Defensive Player of the Year did not win the MVP award, and in six of those years, he failed to receive a single MVP vote.
[8] To adjust for the strike year, we pro-rated the number of wins for each team in 1998-1999 to a number comparable to a typical 82-game season.

exposure due to time zone issues, and because playing in the major eastern media markets yields a possible advantage in voting by media.

The vector of non-performance related player characteristics ($Char_j$) included each player's race, whether the player is international (i.e., whether he was foreign-born), the number of years he had played in the NBA, and whether he had previously won an MVP award. Race data were collected by way of visual inspection; thus, it was visual race discrimination that was considered in our analysis. Because we were researching the question of favorable discrimination for white athletes, only two categories of race were considered relevant: white vs. non-white. Photos for nearly every player were available from www.nba.com and were used for the purpose of differentiating between white and other races. The database from www.databasebasketball.com also indicates the country of birth for each player. This provides a useful, though imprecise method of classifying players as "domestic" or "international."[9]

Finally, we also computed a term reflecting the effect of a new player on the change in the number of wins (from the prior year) for his new team (this term is equal to zero for any player that was not new to his team that year). As will be discussed below, this variable was created in order to test the factor cited by many in the media as a likely reason why Steve Nash was voted MVP in 2005: in his first year with the Phoenix Suns, the team won 62 games, compared to only 29 in the prior year (Associated Press, 2005; Barker, 2005; Kalb, 2006; Le Batard, 2005; Wilbon, 2005). This 33-game improvement from one year to the next was the third-largest in the history of the NBA, ranking behind only the 1989-1990 and 1997-1998 San

[9] For example, Steve Nash was born in South Africa, was raised in Canada, but played collegiately at Santa Clara University in California. Also, Dominique Wilkins, a perennial NBA all-star in the 1980's and 1990's, was born in France, which would likely surprise most NBA followers. On the other hand, dozens of players with Hispanic surnames were born in the United States. To classify Nash and Wilkins as "international" players while classifying these Hispanic players as "domestic" may be inconsistent with the expected origins of those players on the part of the NBA's customers. However, to the extent that this measure is equally imprecise for both domestic and foreign-born players, it remains an unbiased indicator of "international" players.

Antonio Spurs (NBA.com, 2005). The Suns of 2005 were also just the second team in league history to win at least 60 games the season after losing at least 50 (Seattle Times News Services, 2005).

Table 1 contains some descriptive statistics of the data (across years), but separately for those receiving votes in a year from those who did not receive votes. (For the sake of presentation, the per-game player performance statistics shown in the table are not reported vis-à-vis the league leader.) First of all, the table shows that that the racial makeup of those receiving votes is very different than those that do not, though not in the direction associated with discrimination in favor of white players. That is, on average, white players are less likely to receive MVP votes than African-American players. Further, Table 1 reveals stark differences between the performance statistics and team characteristics of players receiving MVP votes and those that do not. For example, MVP vote-getters score more points, garner more rebounds, block more shots and distribute more assists than those players who do not receive votes. None of these statistics should be particular surprising, since the award is nominally designed to identify the best or most valuable player in the league.

Of some interest, however, are the mean values associated with the team-performance related variables. MVP votes are more often given to players on winning teams (especially playoff teams) than those on losing teams. Also, voters are less likely to vote for a new NBA player, as shown by the mean value of the YRSINNBA variable. Players who were traded during the season are less likely to receive MVP votes, though this is likely due to the smaller likelihood of a team trading a player that might be considered among the league's most valuable in the first place.

More surprising are the descriptive statistics for the market-related variables. Players receiving MVP votes are *less* likely to be found in the largest TV markets (BIGMARKET) and *less* likely to play for a team found on the East Coast or in the Eastern Conference. Taken together, these descriptive statistics would decry the existence of any sort of "east coast" bias in MVP balloting. Further, players receiving MVP votes play in smaller television markets than those who do not receive MVP votes.

IV. Empirical Model Development and Results

To isolate the causal effect of these variables, including race, on MVP voting behavior, several Tobit and probit regressions were estimated. In both cases, the results from three specifications are shown. The first specification includes only the player-related performance variables, whereas the second specification adds the team and market-related variables. The third specification then includes the measures of player characteristics which are presumed to be unrelated to on-court performance. However, since the primary question to be addressed is the effect of race on MVP voting behavior, the race variable is included in each of the first three specifications, though we have classified it as a non-performance related characteristic. Moreover, in order to further distinguish the effect of race between players born in the United States and elsewhere, we have also included the binary variable indicating whether the player was born outside the United States in each specification.

Table 2 shows the results from the Tobit regressions. As can be seen, the variable measuring race (WHITE) is not statistically significant[10] in any of the specifications in which it is included. This suggests that after controlling for team and player performance measures, as

[10] All p-values shown in the Tables are two-tailed probabilities. We used 10% as our threshold for statistical significance.

well as market information and other player characteristics, there is no statistical support for the allegation of a racial animus in the balloting.

In the first specification, which includes only the player performance variables,[11] the signs of the coefficients are generally in the expected direction. For example, players who score more points (DIFFPPG), collect more rebounds (DIFFRPG), and distribute more assists (DIFFAPG) are statistically significantly more likely to garner more MVP votes. This is consistent with the descriptives statistics shown in Table 1. Among players at the center position, having more blocked shots (DIFFBLKPG*CENT) is also a significant predictor of MVP votes. This effect is not statistically significant among forwards or guards (the omitted position category). Similarly, forwards who gather more rebounds are more likely to receive MVP votes.[12]

In the second specification, team performance factors and market-related variables are added to the estimated equation. The coefficients indicate, not surprisingly, that players on teams with more wins (DIFFWIN and BESTREC) and teams that increased their win total from the prior season (WINCHG) are statistically more likely to receive more MVP votes, which is again consistent with the mean values shown in Table 1. In contrast, none of the market related effects are shown to be statistically significant determinants of MVP votes, such as the rank of the television market, or whether the team is considered to be on the "east coast" or in a large television market.

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[11] In alternate specifications, we measured the player performance measures relative to the position leader in each season, rather than the league leader. However, those models were always inferior to the models presented in Tables 2, 4 and 6, as measured by the log-likelihood. The specific results from those models are available upon request.

[12] The player's position (Guard, Forward, or Center) was included in each of the first three specifications in order to properly distinguish differences that may exist in the eyes of voters with respect to certain player performance measures. For example, a guard who scores points may be evaluated differently with respect to being the most valuable player than a center who scores the same amount of points per game. To that end, we also interacted these position variables with the primary measures of a player's on-court performance: points per game, rebounds per game, assists per game, blocked shots per game, and steals per game.

The third specification shows the results when all variables are considered, including those characterized as non-performance related. We find that players with more NBA tenure are more likely to receive MVP votes,[13] as are those ranked higher among the top scorers on their own team. Of particular interest is the interaction term (NEWHELP) between the increase in the team's number of wins from the prior season and if the player is in his first year with the team. As mentioned previously, when Steve Nash won the MVP in 2005 after his first year with the Phoenix Suns, one commonly cited reason was the improvement in the team's performance from the prior season: with Nash as the starting point guard, the Suns won 33 more games than in the 2003-2004 season. The coefficient is positive, as expected, and highly statistically significant (p-value of 0.2%).

An alternative approach to investigate the presence of possible race discrimination in MVP voting is to estimate the number of MVP votes for white players using the coefficients estimated from a sample of only non-white players.[14] If white players are indeed being favored in the balloting process, then their estimated number of votes from a non-white player model should be lower than what they actually received, based on the assumption that their performance statistics are being treated more favorably than an otherwise equivalent non-white player. Table 3 shows the difference between the actual and predicted[15] number of MVP votes for the 18 white players who received at least one MVP vote, based on the coefficients estimated from the specification 3 of the Tobit model, but limited to non-white players (n=2,588). As can be seen, one-third of the white players received more MVP votes than predicted, including Steve

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[13] While both Wilt Chamberlain and Wes Unseld won the MVP award as rookies in 1960 and 1969, respectively, none of the rookies in our sample was selected as MVP.

[14] We followed the approach developed by Oaxaca (1973). An anonymous referee also suggested the estimation of coefficients using only white players, but the relatively smaller sample size prevented convergence.

[15] The predicted (expected) values from the Tobit model were calculated as: $E(Votes_j) = \Phi(x'_j\beta / \sigma) \cdot (x'_j\beta + \sigma\lambda_j)$, where λ_j is the ratio of the standard normal probability density and cumulative standard normal distribution functions, evaluated at $x'_j\beta / \sigma$.

Nash's controversial MVP selection in 2005. However, the remaining 67% of white players shown in Table 3 received *fewer* votes than predicted. On average, these 18 players received 11.4 fewer MVP votes than would what be expected from their performance and other statistics, using the same "returns" to those factors as received by non-white players. Among all 592 white players in the sample, including those who did not receive any MVP votes, the average white player received 1.6 fewer MVP votes than would have been predicted.

While the Tobit results show no evidence of racial animus in MVP balloting, it is possible that such discrimination may take a slightly different form, i.e., a player's race may be related to the probability of even appearing on an MVP ballot. That is, since the number of votes related to a fifth place vote is rather small (1 point) compared to not receiving any votes (zero points), the Tobit equation may not sufficiently distinguish these two very different balloting outcomes.

Table 4 shows the results of the probit model measuring the factors associated with a player appearing on an MVP ballot (i.e., he received *any* MVP votes). As before, three specifications were estimated, following the same procedures as shown in Table 2. The results from all of these specifications are consistent with the Tobit model: there is no evidence that a player's race affects the probability he will appear on a voter's MVP ballot. In fact, the p-value associated with the race variable is not lower than 33% in any of the specifications in which it is included.

Not unexpectedly, the factors that lead to an appearance on an MVP ballot are often similar to those that lead to additional MVP votes: players who score more points, collect more rebounds, and block more shots (DIFFBLKPG) are more likely to receive MVP votes.

Additionally, given that the past 11 MVPs have included guards, forwards and centers,[16] it is not surprising that we did not find any direct effect of position on the likelihood of receiving MVP votes. In contrast to the third Tobit model, the third specification of the probit model shows that players who play for one of the five "East Coast" teams are significantly less likely to receive MVP votes, while higher values for NEWHELP does not statistically affect the probability of receiving at least one MVP vote. Also, players on teams that make the playoffs tend to receive at least one MVP vote, while this factor appears irrelevant to how many additional votes they may receive beyond that.

V. Revisiting the MVP Selection of 2005

Table 5 shows the predictive accuracy of the Tobit model specifications in predicting the MVPs. The third specification correctly predicts eight of the past 11 winners, though the controversial selection of Steve Nash in 2005 is not among them. Instead, this model predicts Shaquille O'Neal to be the winner. A review of the predicted number of votes from this specification of the Tobit model shows that the Steve Nash was predicted to finish third in the voting, behind Allen Iverson, who like Shaquille O'Neal, is also African-American. Yet, as previously shown in Tables 2 and 4, there is no statistical support to the claim that Nash unfairly accumulated MVP votes because of his race—in fact, the point estimates of WHITE in the third Tobit specification is negligible (3.63) and is not statistically significantly different from zero. Additionally, even when including the modest effect of being an international player, which is

[16] As can be seen in Table 5, four of the past 11 MVP winners in the sample were guards, five were forwards and two were centers.

positive but statistically insignificant, the collective marginal benefits of these two factors are not sufficient enough to account for his MVP "margin of victory."[17]

As mentioned previously, when Steve Nash won the MVP in 2005 after his first year with the Phoenix Suns, one commonly cited reason was the improvement in the team's performance from the prior season: with Nash as the starting point guard, the Suns won 33 more games than in the 2003-2004 season. While the Tobit and probit models include just such a measure (NEWHELP), it is possible that there is an exponential value in MVP balloting associated with this effect. To determine this, we re-estimated the third specification of the Tobit model, but added the squared value of NEWHELP.[18] Those results are presented in Table 6 as specification 4. As can be seen, with the inclusion of the squared term (NEWHELP2), the coefficient on the linear effect of NEWHELP becomes negative. The estimated coefficient on NEWHELP2 is small, so at first inspection, it would appear that the effect would be rather innocuous. However, in the case of Steve Nash, the 33-game turnaround in wins for his new team translates to 533 more predicted votes[19] than an otherwise equivalent player who was either not new to his team or if new, did not change the team's win total from the prior year. To put that effect into perspective, Nash's actual margin of victory was only 34 votes. Not surprisingly then, Steve Nash is forecasted to be the MVP winner in the 2005 season with the inclusion of this squared term. This specification correctly predicts nine of the past 11 MVP winners.

It is entirely possible, however, that the magnitude and statistical significance of NEWHELP and the squared term is driven by the extreme value Nash garnered for this variable

[17] The sum of the coefficients relating to race (3.63) and international (18.31) are less than the 34 point difference between Nash and O'Neal in 2005. These coefficients were not adjusted for censoring, as both Nash and O'Neal received MVP votes.

[18] Since NEWHELP can be both positive or negative, depending on whether the team won or lost more games compared to the prior year, the squared value of NEWHELP was then multiplied by negative one if NEWHELP was less than zero.

[19] Calculated as 33*33*0.75 less 33*8.6, which equates to 532.95.

in 2005. To test this, we re-estimated specification 4 in Table 6, but excluded the 2004-2005 season from the analysis and also omitted the WHITE variable. Those results are shown in Table 6 as specification 5. As can be seen, both the linear and squared effects of NEWHELP are statistically significant at the 10% level. Further, this specification correctly forecasts eight of the past ten MVP winners in that sample. The coefficients from this specification were then used to predict the MVP winner for the 2004-2005 season: Steve Nash. Therefore, it is unlikely that Nash's extreme value related to this variable in 2004-2005 is driving the statistical significance of the estimated parameters in Specification 3. Further, since the race variable was excluded from this specification, Nash's *predicted* vote totals in 2004-2005 were unaffected by his race.

Still, the sheer magnitude of the effect from NEWHELP seems unreasonable and calls for further investigation. The data show that in the 11 years of voting data included in this study, not only did Steve Nash have the highest value of NEWHELP among those players receiving MVP votes, he also was the only white player with a positive value of NEWHELP in that group as well. It seems more likely that this data point represents an outlier,[20] and the variable itself may be highly correlated with race. If so, then the multicollinearity could lower the estimated standard error for the race variable, leading to a conclusion of an insignificant racial effect when in fact one exists.

We tested for multicollinearity in two ways. First, we estimated simple (Spearman) correlation coefficients between NEWHELP (as well as all other variables in specification 3) and race, specifically if a player is white. Those results are shown in Table 7. The correlations were calculated for both the full sample and for the subset of players who receive MVP votes. Regardless of the sample, however, the correlation between race and NEWHELP is not

[20] The next highest value of NEWHELP belonged to Jason Kidd, in 2002, when the New Jersey Nets' won an additional 26 games in the first year Kidd played with the team. Nash's value of NEWHELP is 27% higher than Kidd's, and 2,474% higher than the average player who receives MVP votes.

statistically significant at conventional levels. The correlations do show, however, that some of the player performance related measures, such as points per game, are correlated with race among those receiving MVP votes.

Second, we re-estimated the fifth specification in Table 6 without the NEWHELP variables, but added the race variable back into the model. Those results are shown in specification 6 of Table 6. If the NEWHELP variable was acting as a proxy for white players, then the removal of NEWHELP should result in a (more) significant racial effect. However, the results show that the race variable is even less statistically insignificant. Not surprisingly, not including NEWHELP in the model lowers its explanatory power, at least when compared with the fourth and fifth specifications. The model correctly identifies eight of the past 11 MVP winners; Steve Nash is not among them. In fact, with the race variable in the model to capture any racial bias hypothesized to be in his favor, but without the NEWHELP measure, Nash is predicted to finish eighth; of the seven players predicted to finish in front of him, six of those were African-American. Once again, the charges of racial discrimination against African-American players are not supported by the data.

VI. Conclusion

The designation of the most valuable player in the NBA has been the source of some controversy in recent years. Some have argued that race has played a role in the determination of the winner, in the wake of the controversial selection of Steve Nash in 2005. Using two different estimation methods when examining player and team data from 1995 through 2005, we found no evidence that discrimination exists in either the act of receiving any MVP votes or the ultimate level of support received from voters. In the case of Steve Nash in 2005, the exceptional improvement in team wins associated with his addition to the Phoenix Suns appears to explain his selection by voters.

Table 1: Descriptive Statistics of Players, 1995-2005 Seasons.

Variable	Variable Description	Players Not Receiving MVP Votes	Players Receiving MVP Votes
WHITE	Race=Caucasian indicator	19.2%	9.6%
INTERNATIONAL	Player was born outside of USA	9.8%	14.9%
GUARD	Position=Guard	42.8%	42.6%
FORWARD	Position=Forward	42.7%	40.4%
CENTER	Position=Center	14.5%	17.0%
PPG [a]	Points scored per game	9.8	21.4
RPG [a]	Total rebounds per game	4.3	7.7
APG [a]	Assists per game	2.2	4.7
BLKPG [a]	Blocked Shots per game	0.5	1.1
STLPG [a]	Steals per game	0.8	1.4
FGMPG [a]	Field goals made per game	3.7	7.9
TURNPG [a]	Turnovers per game	1.5	2.8
FOULPG [a]	Personal Fouls per game	2.3	2.6
RANK	Scoring rank on team (1=highest)	5.7	1.7
YRSINNBA	Number of years played in NBA	5.1	6.4
PRIORMVP	Player was MVP in a prior season	0.5%	17.6%
TRADED	Traded during current season indicator	8.7%	1.1%
WINCHG [a]	Change in number of team's wins from prior season	-0.1	4.6
NEWHELP	Change in number of team’s wins from prior season, if player was new to his team that year (0 otherwise)	0.0	1.3
WIN	Games won by team in current season	40.3	51.8
BESTREC	Best yearly win-loss record indicator	3.7%	14.9%
PLAYOFFTEAM	Team made playoffs that season indicator	53.3%	88.3%
CONFEAST	Eastern Conference Indicator	52.1%	43.6%
TV_HOUSEHOLDS	Number of household in television market (in millions)	2.3	2.2
TVRANK	Ranking of teams' TV market (1=largest)	16.1	17.0
EASTCOAST	Team's television market is NY/NJ, Boston, Philadelphia, Washington D.C.	17.7%	10.6%
BIGMARKET	Team is one of 9 largest TV markets	38.5%	30.9%

a: In the estimation of the models, these variables are recalculated as the difference between the player and the league leader that season. All such variables contain the prefix “DIFF” in the variable name.

Table 2: Tobit Regression Results

	Specification 1		Specification 2		Specification 3	
	Coefficient	p-Value	Coefficient	p-Value	Coefficient	p-Value
Sample Size	3,180		3,180		3,180	
Log Likelihood	-1,461.58		-1,377.23		-1,366.18	
Scale Parameter	268.87	N/A	217.48	N/A	209.72	N/A
Intercept	1504.19	0.0%	1000.51	0.0%	937.15	0.0%
WHITE	40.67	47.4%	-0.38	99.4%	3.63	94.6%
INTERNATIONAL	43.89	45.0%	17.08	74.1%	18.31	72.6%
CENTER (CENT)	269.66	49.7%	111.15	75.3%	11.39	97.5%
FORWARD (FWD)	284.74	22.4%	325.02	12.4%	313.11	13.3%
DIFFPPG	67.90	0.0%	63.52	0.0%	62.92	0.0%
DIFFRPG	36.94	0.5%	28.82	1.2%	28.73	1.2%
DIFFAPG	58.24	0.0%	44.84	0.0%	40.38	0.0%
DIFFBLKPG	15.43	79.3%	-33.55	52.8%	-29.87	56.8%
DIFFSTLPG	71.75	13.0%	46.72	27.8%	56.46	19.2%
DIFFTURNPG	62.37	4.8%	-28.36	35.8%	-33.85	27.0%
DIFFFOULPG	168.16	0.0%	143.77	0.0%	143.26	0.0%
DIFFFGMPG	-41.54	4.6%	-38.17	4.4%	-44.23	1.8%
DIFFPPG*CENT	10.46	23.2%	-2.04	79.9%	-2.38	76.7%
DIFFPPG*FWD	-0.51	94.4%	-6.13	36.8%	-7.31	27.7%
DIFFRPG*CENT	-2.27	93.5%	17.17	50.3%	12.37	61.7%
DIFFRPG*FWD	38.42	1.7%	28.70	4.3%	23.88	8.7%
DIFFAPG*CENT	-9.90	80.4%	-15.87	65.1%	-11.46	74.3%
DIFFAPG*FWD	-11.47	54.2%	-14.21	39.9%	-13.41	41.6%
DIFFBLKPG*CENT	187.23	2.4%	178.11	1.7%	171.84	1.8%
DIFFBLKPG*FWD	62.17	34.7%	107.39	7.5%	125.18	3.4%
DIFFSTLPG*CENT	-176.89	16.0%	-204.93	6.8%	-250.49	2.5%
DIFFSTLPG*FWD	-76.94	32.9%	-49.97	49.0%	-65.59	35.7%
WINCHG	---	---	4.66	0.1%	3.75	1.1%
DIFFWIN	---	---	9.81	0.0%	9.46	0.0%
BESTREC	---	---	166.09	0.0%	162.97	0.0%
PLAYOFFTEAM	---	---	43.17	36.5%	39.39	40.1%
CONFEAST	---	---	38.56	22.0%	42.10	17.1%
TV_HOUSEHOLDS	---	---	0.00	97.6%	0.00	82.4%
TVRANK	---	---	1.57	37.0%	1.23	47.4%
EASTCOAST	---	---	-74.80	19.6%	-89.20	12.0%
BIGMARKET	---	---	-4.38	93.0%	8.55	86.3%
NEWHELP	---	---	---	---	8.60	0.2%
RANK	---	---	---	---	-21.98	7.1%
YRSINNBA	---	---	---	---	11.04	1.6%
TRADED	---	---	---	---	7.27	93.8%
PRIORMVP	---	---	---	---	2.88	95.5%

Table 3: Oaxaca Decomposition Results
Predicted MVP Votes of White Players with MVP Votes Based on Coefficients from African-American Only Tobit Model (Specification 3)

Player	Team	Year	Actual MVP Votes	Predicted MVP Votes	Difference
Steve Nash	Phoenix	2005	1066	277.7	788.3
Pedrag Stojakovic	Sacramento	2004	281	172.9	108.1
John Stockton	Utah	1996	12	3.4	8.6
John Stockton	Utah	1995	47	40.6	6.4
Arvydas Sabonis	Portland	1999	3	0.4	2.6
Rik Smits	Indianapolis	1998	2	1.9	0.1
John Stockton	Utah	2001	1	2.2	-1.2
Steve Nash	Dallas	2002	5	12.5	-7.5
Tom Gugliotta	Minnesota	1997	1	12.7	-11.7
John Stockton	Utah	1997	3	16.1	-13.1
John Stockton	Utah	1998	5	44.6	-39.6
Dirk Nowitzki	Dallas	2005	349	396.2	-47.2
Steve Nash	Dallas	2003	1	72.0	-71.0
Andrei Kirilenko	Utah	2004	2	75.2	-73.2
Dirk Nowitzki	Dallas	2004	4	155.6	-151.6
Pedrag Stojakovic	Sacramento	2002	1	158.5	-157.5
Dirk Nowitzki	Dallas	2002	31	190.0	-159.0
Dirk Nowitzki	Dallas	2003	43	429.5	-386.5

Table 4: Probit Regression Results

	Specification 1		Specification 2		Specification 3	
	Coefficient	p-Value	Coefficient	p-Value	Coefficient	p-Value
Sample Size	3,180		3,180		3,180	
Log Likelihood	-288.24		-221.48		-217.97	
Percent of MVP vote getters correctly classified	94.2%		95.2%		92.0%	
Percent of non-MVP vote getters correctly classified	89.0%		91.7%		94.7%	
Intercept	7.34	0.0%	6.36	0.0%	5.87	0.0%
WHITE	0.21	33.2%	0.07	80.2%	0.08	77.1%
INTERNATIONAL	0.09	71.8%	-0.07	81.4%	-0.07	82.6%
CENTER (CENT)	1.44	23.0%	0.78	54.5%	0.59	65.8%
FORWARD (FWD)	-0.66	37.1%	-0.34	67.8%	-0.32	70.3%
DIFFPPG	0.30	0.0%	0.32	0.0%	0.29	0.0%
DIFFRPG	0.16	0.0%	0.18	0.0%	0.18	0.0%
DIFFAPG	0.21	0.3%	0.15	4.6%	0.14	6.3%
DIFFBLKPG	0.42	0.2%	0.34	2.5%	0.34	2.6%
DIFFSTLPG	0.35	11.2%	0.29	25.2%	0.24	36.0%
DIFFTURNPG	0.20	13.0%	-0.18	25.7%	-0.23	16.7%
DIFFFOULPG	0.60	0.0%	0.62	0.0%	0.65	0.0%
DIFFFGMPG	-0.24	0.5%	-0.26	0.9%	-0.26	1.1%
DIFFPPG*CENT	0.06	4.5%	0.02	59.5%	0.01	72.7%
DIFFPPG*FWD	-0.05	2.2%	-0.04	8.2%	-0.04	9.1%
DIFFRPG*CENT	-0.11	15.3%	-0.07	43.0%	-0.08	37.1%
DIFFRPG*FWD	0.12	1.5%	0.10	7.1%	0.10	6.5%
DIFFAPG*CENT	0.03	79.8%	0.03	81.3%	0.05	73.1%
DIFFAPG*FWD	-0.06	42.7%	-0.10	25.9%	-0.11	19.1%
DIFFBLKPG*CENT	0.39	5.7%	0.31	18.5%	0.30	19.7%
DIFFBLKPG*FWD	-0.20	18.1%	-0.03	88.6%	-0.02	92.8%
DIFFSTLPG*CENT	-0.03	93.4%	-0.14	76.4%	-0.23	63.7%
DIFFSTLPG*FWD	0.10	71.8%	0.14	64.5%	0.19	55.4%
WINCHG			0.03	0.0%	0.03	0.1%
DIFFWIN			0.04	0.0%	0.04	0.1%
BESTREC			0.63	2.6%	0.66	2.2%
PLAYOFFTEAM			0.41	8.7%	0.42	8.2%
CONFEAST			0.06	70.5%	0.08	63.8%
TV_HOUSEHOLDS			0.00	46.2%	0.00	40.2%
TVRANK			0.00	78.0%	0.00	97.9%
EASTCOAST			-0.55	5.9%	-0.62	3.8%
BIGMARKET			0.16	51.9%	0.20	42.1%
NEWHELP					0.00	76.2%
RANK					-0.11	6.3%
YRSINNBA					0.04	6.8%
TRADED					-0.02	95.9%
PRIORMVP					-0.06	87.4%

Table 5: Comparison of NBA MVPs with Predictions from Tobit Models

Year of Award	Winner (Position)	Specification 1 Prediction	Specification 2 Prediction	Specification 3 Prediction
1995	David Robinson (C)	David Robinson	David Robinson	David Robinson
1996	Michael Jordan (G)	David Robinson	Michael Jordan	Michael Jordan
1997	Karl Malone (F)	Shaquille O'Neal	Michael Jordan	Michael Jordan
1998	Michael Jordan (G)	Shaquille O'Neal	Karl Malone	Michael Jordan
1999	Karl Malone (F)	Shaquille O'Neal	Tim Duncan	Karl Malone
2000	Shaquille O'Neal (C)	Shaquille O'Neal	Shaquille O'Neal	Shaquille O'Neal
2001	Allen Iverson (G)	Shaquille O'Neal	Tim Duncan	Shaquille O'Neal
2002	Tim Duncan (F)	Tim Duncan	Tim Duncan	Tim Duncan
2003	Tim Duncan (F)	Shaquille O'Neal	Tim Duncan	Tim Duncan
2004	Kevin Garnett (F)	Kevin Garnett	Kevin Garnett	Kevin Garnett
2005	Steve Nash (G)	Kevin Garnett	Allen Iverson	Shaquille O'Neal
Number of Winners Correctly Predicted		4	6	8

Table 6: Alternate Tobit Regression Results

	Specification 4		Specification 5		Specification 6	
	Coefficient	p-Value	Coefficient	p-Value	Coefficient	p-Value
Sample Size	3,180		2,880		3,180	
Log Likelihood	-1,361.92		-1,225.00		-1,370.88	
Scale Parameter	205.81	N/A	190.67	N/A	214.13	N/A
Intercept	893.72	0.0%	963.84	0.0%	924.21	0.0%
WHITE	-1.74	97.4%	---	---	1.63	97.6%
INTERNATIONAL	7.91	87.8%	-31.69	49.2%	27.15	61.0%
CENTER (CENT)	66.05	84.9%	2.31	99.5%	-76.14	83.6%
FORWARD (FWD)	350.24	8.8%	415.02	4.6%	267.04	20.7%
DIFFPPG	62.86	0.0%	61.25	0.0%	59.57	0.0%
DIFFRPG	26.03	2.1%	27.27	1.1%	30.26	0.9%
DIFFAPG	40.86	0.0%	34.55	0.1%	41.51	0.0%
DIFFBLKPG	-36.94	47.5%	-32.76	51.8%	-26.13	62.2%
DIFFSTLPG	59.56	16.3%	70.37	9.2%	55.37	20.5%
DIFFTURNPG	-32.96	27.5%	-48.49	11.4%	-38.52	22.0%
DIFFFOULPG	139.61	0.0%	155.01	0.0%	142.90	0.0%
DIFFFGMPG	-45.05	1.5%	-49.98	1.1%	-38.36	4.2%
DIFFPPG*CENT	-3.13	69.2%	1.02	90.3%	-0.79	92.3%
DIFFPPG*FWD	-7.50	26.2%	2.44	71.8%	-6.42	35.0%
DIFFRPG*CENT	17.34	47.0%	5.21	82.9%	14.19	57.5%
DIFFRPG*FWD	25.84	6.1%	23.59	7.9%	24.11	9.0%
DIFFAPG*CENT	-14.02	68.5%	-13.90	67.9%	-16.78	63.8%
DIFFAPG*FWD	-16.44	31.3%	-21.94	18.7%	-16.31	33.3%
DIFFBLKPG*CENT	176.42	1.4%	129.14	6.3%	167.51	2.3%
DIFFBLKPG*FWD	135.98	2.0%	159.65	0.6%	113.84	5.8%
DIFFSTLPG*CENT	-242.02	2.6%	-224.10	4.3%	-271.19	1.8%
DIFFSTLPG*FWD	-70.49	31.3%	-101.01	14.8%	-63.79	37.9%
WINCHG	3.72	1.1%	4.67	0.2%	5.60	0.0%
DIFFWIN	9.46	0.0%	10.94	0.0%	8.81	0.0%
BESTREC	145.22	0.1%	169.69	0.0%	171.87	0.0%
PLAYOFFTEAM	38.54	40.1%	27.49	55.0%	43.17	36.3%
CONFEAST	45.66	13.2%	51.42	8.6%	44.56	15.7%
TV_HOUSEHOLDS	0.00	77.4%	0.00	43.5%	0.00	84.0%
TVRANK	1.16	49.4%	-1.27	46.8%	0.94	59.4%
EASTCOAST	-100.43	7.6%	-106.67	6.0%	-95.62	10.0%
BIGMARKET	19.84	68.5%	9.33	84.7%	3.73	94.1%
NEWHELP	-8.60	18.2%	-12.45	7.8%	---	---
NEWHELP2	0.75	0.3%	0.87	0.5%	---	---
RANK	-25.41	3.8%	-24.59	4.3%	-20.47	9.8%
YRSINNBA	11.63	1.0%	9.66	3.1%	13.10	0.5%
TRADED	-21.06	82.4%	-52.71	67.5%	0.91	99.3%
PRIORMVP	3.14	95.1%	4.84	92.4%	6.56	90.1%
Number of Winners Correctly Predicted	9 of 11		8 of 10 in sample; 9 of 11 overall		8 of 11	

Table 7: Correlation with Race (WHITE) and Selected Variables

	Full Sample (n=3,180)		MVP Vote Recipients (n=188)	
Variable	**Spearman Correlation Coefficient**	**Probability of occurring by chance**	**Spearman Correlation Coefficient**	**Probability of occurring by chance**
DIFFPPG	-0.12	0.0%	-0.24	0.1%
DIFFRPG	0.00	91.2%	-0.16	2.9%
DIFFAPG	-0.09	0.0%	0.10	19.3%
DIFFSTLPG	-0.16	0.0%	-0.04	57.7%
DIFFFOULPG	0.02	25.8%	0.11	12.0%
DIFFFGMPG	-0.11	0.0%	-0.22	0.3%
WINCHG	-0.00	95.8%	0.01	90.6%
DIFFWIN	0.05	0.3%	0.20	0.7%
BESTREC	0.06	0.1%	0.12	10.8%
CONFEAST	-0.08	0.0%	-0.25	0.1%
EASTCOAST	-0.08	0.0%	-0.11	12.5%
NEWHELP	0.00	91.4%	-0.03	67.2%
RANK	11.3	0.0%	0.18	1.3%
YRSINNBA	-0.08	0.0%	0.03	73.3%

References

Associated Press (2005). "Nash receives 65 first-place votes." ESPN.com, May 9. Retrieved on February 15, 2007 from sports.espn.go.com/nba/news/story?id=2055839.

Barker, Scott (2005). "Steve Nash versus Shaquille O'Neal." May 9. Retrieved on February 15, 2007 from sports.mostvaluablenetwork.com/general/nba/steve-nash-versus-shaquille-o-neal/.

Becker, Gary. The Economics of Discrimination. Chicago: Univ. Chicago Press, 1957.

Brown, E., Spiro, R., and Keenan, Diane (1991). "Wage and Nonwage Discrimination in Professional Basketball: Do Fans Affect It?" American Journal of Economics and Sociology, Vol. 50, No. 3, (July), pp. 333-345.

Burdekin, Richard C. K. and Idson, Todd L., (1991) "Customer Preferences, Attendance and the Racial Structure of Professional Basketball Teams," Applied Economics, Vol. 23, pp. 179-186.

Burdekin, Richard C., Hossfield, Richard, and Smith, Janet (2005). "Are NBA Fans Becoming Indifferent to Race? Evidence from the 1990s." Journal of Sports Economics, Vol. 6, No. 2, pp. 144-159.

Findlay, David W. and Reid, Clifford E. (1997). "Voting Behavior, Discrimination and the National Baseball Hall of Fame," Economic Inquiry, Vol. 35, pp. 562-578.

Gwartney, James and Haworth, Charles (1974). "Employer Costs and Discrimination: The Case of Baseball." Journal of Political Economy, Vol 82, pp. 873-881.

Hamilton, Barton Hughes (1997). "Racial Discrimination and Professional Basketball Salaries in the 1990's." Applied Economics. Vol. 29, No. 3 (March), pp. 287-296.

Hannsen, Andrew (1998). "The Cost of Discrimination: A Study of Major League Baseball." Southern Economic Journal, Vol 64, No. 3, pp. 603-627.

Hannsen, F. Andrew and Andersen, Torben (1999). "Has Discrimination Lessened Over Time? A Test Using Baseball's All-Star Vote," Economic Inquiry, Vol. 37, No. 2, pp. 326-352.

Hoang, Ha and Rascher, Dan (1999), "The NBA, Exit Discrimination, and Career Earnings" Industrial Relations, Vol. 38, No. 1, 69–91.

Kalb, Eliott (2006). "On the Rise?" NBA.com. Retrieved on February 15, 2007 from www.nba.com/encyclopedia/suns_ontherise.html.

Kahn, Lawrence M. (1991), "Discrimination in Professional Sports: A Survey of the Literature" Industrial and Labor Relations Review, Vol. 44, No. 3, pp. 395-418.

Kahn, Lawrence M., and Shah, Malav (2005), “Race, Compensation and Contract Length in the NBA: 2001-2002,” Industrial Relations, Vol. 44, No. 3, pp. 444–462.

Kahn, Lawrence M., and Sherer, Peter D. (1988), “Racial Differences in Professional Basketball Players Compensation,” Journal of Labor Economics, Vol. 6, No. 1, pp. 40-61.

Kanazawa, Mark and Funk, Jonas (2001). “Racial Discrimination in Professional Basketball: Evidence from Nielson Ratings.” Economic Inquiry, Vol. 39, No. 4, pp. 599-608.

Le Batard, Dan (2005). “Unprecedented Choice for MVP Begs Question.” Miami Herald, May 8, Section 1C.

McCormick, R. and Tollison, R. (2001). “Why do black basketball players work more for less money?” Journal of Economic Behavior & Organization, Vol. 44, pp. 201–219.

McNeal, Stan (2006). “Split decision: Who will win MVP?” SportingNews.com (April 11), Retrieved on Oct. 19, 2006, from www.sportingnews.com/yourturn/viewtopic.php?p=592594.

Nardinelli, Clark and Simon, Curtis (1990). “Customer Racial Discrimination in the Market for Memorabilia: The Case of Baseball.” The Quarterly Journal of Economics, Vol. 105, pp. 575-595.

NBA.com (2005). “Steve Nash Named 2004-05 NBA MVP.” Retrieved on February 15, 2007, from www.nba.com/news/nash_mvp_050508.html.

NBA.com (2006). “Suns’ Steve Nash Wins Second Consecutive MVP Award.” Retrieved on Oct. 19, 2006, from www.nba.com/news/nash_mvp_05-06.html.

Oaxaca, Ronald (1973). “Male-Female Wage Differentials in Urban Labor Markets.” International Economic Review, Vol. 14, No. 3, pp. 693-709.

Seattle Times News Services (2005). “Nash Reportedly Edges Shaq for MVP.” Seattle Times, May 7, p. D10.

Stone, Eric W. and Warren, Ronald S. (1997), "Customer Discrimination in Professional Basketball: Evidence from the Trading-Card Market," Applied Economics, Vol. 31, No. 6, pp. 679-686.

Wilbon, Michael (2005). “Giving the Selection Some Value.” Washington Post, May 10, p. D01.