# Are NBA Fans Becoming Indifferent to Race?

## Evidence From the 1990s

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*Previous work found the racial composition of NBA teams to be positively correlated with the racial composition of their metropolitan markets in the 1980s. We find continued evidence of this relationship during the 1990s, with accompanying revenue gains from the inclusion of White players on teams located in whiter areas. And, as the number of White players declined significantly throughout the decade, the revenue product of a White player actually increased on the margin. The tendency for top-performing White players in the NBA to locate in cities with larger White populations also is consistent with their higher marginal value in such locations.*

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Applied to professional sports, Becker's (1971) concept of racial discrimination by customers is embodied by fan preference for watching players of their own race. The *customer-discrimination hypothesis* implies that teams lose revenue and profits when they adopt color-neutral hiring practices. Accordingly, unlike discrimination by employers and by fellow workers, discrimination by customers is unlikely to disappear even in the long run (Nardinelli & Simon, 1990). Although discrimination by customers generally cannot be disentangled from other influences on hiring

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practices and wage scales, Holzer and Ihlanfeldt's (1998) survey evidence from four major metropolitan areas suggested that customer discrimination remains quite pervasive—with strong discrimination effects emerging when employees have significant contact with customers.

It is hard to imagine a business where employees are more "visible" to customers than professional basketball. Consistent with the customer-discrimination hypothesis, a number of studies, using data from the 1980s, found that National Basketball Association (NBA) teams located in more White-dominated market areas consistently had a disproportionately large share of White players (Bodvarsson & Partridge, 2001; Brown, Spiro, & Keenan, 1991; Burdekin & Idson, 1991; Hoang & Rascher, 1999; Koch & Vander Hill, 1988).[1] The decline in the number of White players in the NBA since the 1980s raises the possibility that professional basketball teams may have become more "color-blind" in their hiring practices throughout the years. Evidence on whether or not customer-based discrimination has, in fact, declined in the NBA could offer a valuable litmus test of the relevance of customer discrimination in today's economy—given the unusual visibility of not only the players themselves but also NBA teams' hiring decisions by race.

In addition to using NBA team data from the 1990s to reexamine the relationship between the racial composition of teams and the racial composition of their market areas, we address the question of whether teams have effectively boosted their attendance and revenues by "matching" the racial profile of their players with their market's racial profile. Prior evidence on this point is mixed. Burdekin and Idson (1991) and Hoang and Rascher (1999) found that a positive match between team racial composition and the racial composition of the SMSA area increases attendance. Kahn and Sherer (1988) added that White players increased attendance more than enough to compensate for the White salary premium they identified for the 1980-1986 period. On the other hand, Dey (1997), using data from 1987 to 1993, and McCormick and Tollison (2001), using data from 1980 to 1988, saw no relationship between the racial match and NBA attendance.[2]

Our approach has three parts. We first analyze trends in the racial composition of NBA teams and document the distribution of players, classified by race, among teams. Differences in the performance of Black and White players can shed light on whether teams in the league engage in "window dressing" by adding White players to their rosters who are not as strong as Black players. We next examine what determines the racial composition of NBA teams and assess whether a team can increase its attendance by matching its racial composition with the racial composition of the metropolitan area where the team is located. This is based on the premise that not just Whites but also Blacks prefer to watch athletes of their own race—and that satisfying these preferences leads to attendance gains. Finally, we look at the role of racial factors in the trading of NBA players and identify a tendency for the most skilled White players to stay in whiter cities.

## TEAM RACIAL COMPOSITION AND PLAYER PERFORMANCE

Annual data from the 1990-1999 period bring out the sharp decline in total White representation in the NBA, falling from just more than 25% in the 1990-1991 season to 20% in the 1998-1999 season (see Figure 1). This result corresponds with declining White representation on the bench, which fell from 30% to 23%. There has been little change in the percentage of starters who are White, however, which remained below 15% across most of the sample period.

As Table 1 shows, White players and Black players remain unevenly distributed among NBA teams. Although, on average, the Chicago Bulls and Utah Jazz teams were just over 33% White during the 1990s, at the other extreme, the New York Knicks and Toronto Raptors were under 10% White. Available data on total minutes played during the 1996-1997 through 1998-1999 seasons suggest an even greater disparity (see column B of Table 1). The percentage of total minutes accounted for by White players ranges from a high of 44.7% for the Utah Jazz to 4% for the Toronto Raptors. Admittedly, many factors besides customer preferences could lie behind the varying racial compositions of NBA teams—including the race of available draft picks, existing contractual obligations, the availability of free agents, and increased player demand arising from two expansion teams (Toronto Raptors and Vancouver Grizzlies).

There is no evidence, however, at least in recent years, that fan preferences for watching players of their own race have led to inferior White players entering the NBA in place of more skilled Black counterparts. Not only has the overall representation of White players in the NBA declined in recent years, but also the performance levels of White players and Black players appear similar. In Table 2, we use annual player statistics for 1996-1997 through 1998-1999 to compare the average performance of Whites and Blacks. We examine starters and bench players separately throughout a range of measures—points scored, assists, total rebounds, blocks, and field-goal percentage—that have consistently been found to impact salary (see Berri, 2003).[3] *Starters* are the top five players on each team in terms of minutes played per game, whereas *bench players* constitute the remainder. Significant differences between average Black player and average White player performance emerge in only 3 cases out of 10, and there seems to be no systematic tendency for players of one race to outperform those of the other. Indeed, White starters outperform Black starters in field-goal percentage but are statistically tied in all other categories. Black bench players outperform their White counterparts in assists and total points per game but are statistically equal in the other three categories.

We base our White and Black performance-level findings on player data from the last three seasons of the 1990s, a period during which there is little evidence of overall salary discrimination against Blacks in the NBA. Indeed, the NBA appears to have changed markedly in this regard since the 1980s, when a number of studies

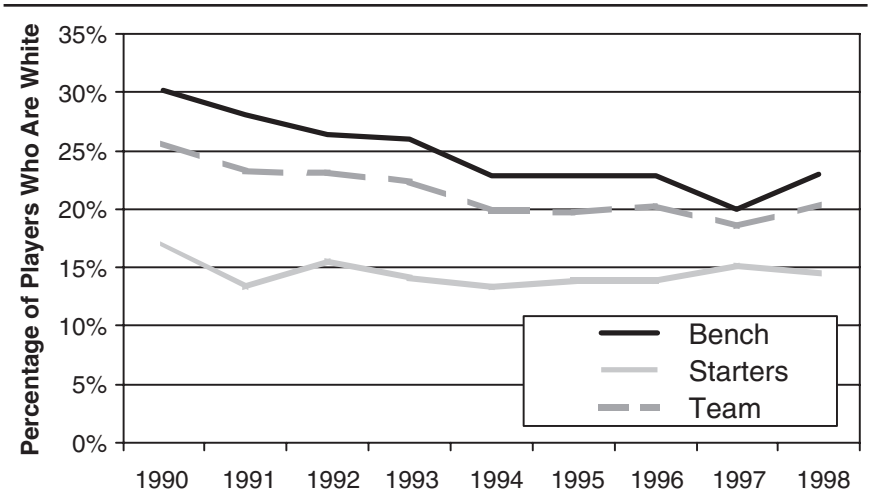


Figure 1: Average Racial Composition of NBA Teams Over Time

NOTE: A regression of percent of team that is White (TWHITE) on a time trend generates a negative coefficient (*t* statistic of 2.80, significant at the .01 level). A corresponding regression of percentage of bench that is White (BWHITE) on time generates a negative coefficient (*t* statistic of 3.30, significant at the .01 level). The coefficient in the regression of percentage of starters, however, who are White (SWHITE) on time is not statistically different from zero (*t* statistic of 0.36).

found that Whites were paid more than Blacks for the same level of performance (see Kahn, 2000).[4] Although most of the salary-based studies focus on aggregate measures of performance and salaries, a few consider how the fan base in a metro area may differentially affect salaries. For example, Bodvarsson and Partridge (2001) found that Black players in two seasons (1985-1986 and 1990-1991) were paid more in areas where the Black population was higher. They argued that this finding may reflect "black fans wanting to see a team with a greater percentage of blacks" (Bodvarsson & Partridge, 2001, p. 413). Although no such population effect was significant in their regressions of White player salary levels, the possibility that Black-White salary levels may vary with the racial composition of the market area is consistent with the customer-discrimination hypothesis. Even if *average* performance-adjusted salary levels of Whites and Blacks are equal, so that there is no aggregate discrimination, this does not preclude team-specific, or market area–specific, differences in the relative salaries of Whites and Blacks.[5]

## DETERMININANTS OF THE RACIAL COMPOSITION OF NBA TEAMS

A match between the racial composition of an NBA team and the racial composition of its metropolitan market suggests that teams are responding to customer

TABLE 1: Racial Composition of NBA Teams, 1990-1998

| *Team* | *Percentage White 1990-1991 to 1998-1999 Seasons* | *Percentage of Total Minutes Played by White Players 1996-1997 to 1998-1999 Seasons* |
|---|---|---|
| Chicago | 34.8 | 37.5 |
| Utah | 33.3 | 44.7 |
| Phoenix | 29.3 | 34.0 |
| Cleveland | 29.2 | 32.7 |
| Orlando | 27.9 | 16.3 |
| Golden State | 25.7 | 9.7 |
| Seattle | 25.2 | 24.5 |
| New Jersey | 25.2 | 20.4 |
| Indiana | 24.8 | 23.9 |
| Milwaukee | 24.3 | 6.8 |
| Washington | 24.3 | 7.7 |
| Atlanta | 23.6 | 14.2 |
| Minnesota | 21.6 | 16.3 |
| Dallas | 21.5 | 18.9 |
| Charlotte | 21.3 | 14.8 |
| Sacramento | 21.0 | 18.8 |
| Boston | 20.7 | 19.4 |
| Houston | 20.6 | 19.0 |
| Miami | 20.4 | 15.9 |
| San Antonio | 17.0 | 18.7 |
| Denver | 16.8 | 8.5 |
| Vancouver* | 16.1 | 19.3 |
| Detroit | 15.1 | 9.0 |
| LA Clippers | 14.2 | 12.9 |
| Philadelphia | 13.4 | 10.7 |
| LA Lakers | 13.0 | 5.2 |
| Portland | 12.2 | 12.8 |
| New York | 9.9 | 5.1 |
| Toronto* | 5.8 | 4.0 |
| All Teams | 20.97 | 17.30 |
| U.S. Teams | 21.72 | 17.72 |

NOTE: Column 1 shows, by NBA team, the mean percentage of players on the team's roster who are White, averaged over nine seasons (1990-1991 through 1998-1999). Column 2 shows the percentage of total minutes played by White players for all games over three seasons (1996-1997 to 1998-1999). Data are from *Official NBA Register* (Sporting News, various years), *Official NBA Guide* (Sporting News, various years), and the NBA Web site (see www.nba.com).
*For expansion teams, Vancouver and Toronto, column 2 data are available for only four seasons (1995-1998).

discrimination. We examine the relation between the racial composition of teams and their respective markets using SMSA and NBA team data from the 1990-1991

TABLE 2: Performance Statistics for NBA Starters and Bench Players

| *1. Starters* | *Performance Measure* — *Black Players* | *Mean Performance Measure* — *White Players* | T *Test of Difference in Means* |
|---|---|---|---|
| Assists | .0915 | .0903 | 0.102 |
| Blocks | .0193 | .0259 | –1.386 |
| Field-goal percentage | .4514 | .4729 | –2.394** |
| Points | .4082 | .3969 | 0.703 |
| Rebounds | .1681 | .1853 | –1.160 |
| *2. Bench Players* | *Performance Measure* — *Black Players* | *Mean Performance Measure* — *White Players* | T *Test of Difference in Means* |
| Assists | .0659 | .0637 | 1.936** |
| Blocks | .0203 | .0235 | –1.169 |
| Field goals percentage | .4076 | .4025 | 0.407 |
| Points | .3348 | .3128 | 1.654** |
| Rebounds | .1693 | .1823 | –1.303 |

NOTE: This table shows the mean values of five key performance measures averaged over three seasons (1996-1998) that the player played as a starter, or bench player, respectively. A player is classified as a starter if he is one of the five players on the team who played the most total minutes over the course of the season. A player is classified as a bench player if he is on the team's roster but is not one of the five players on the team who played the most total minutes over the course of the season. Except for field-goal percentage, all performance measures are standardized by total minutes played in the season. Data are from the NBA Web site (see www.nba.com).
In section 1, total sample size equals 228 (35 starters who are White and 193 starters who are Black). In section 2, total sample size equals 476 (110 bench players who are White and 366 who are Black).
**Significant at the .05 level, two-tailed test.

through 1998-1999 seasons. We measure team racial composition in three ways: the percentage of all team members who are White, the percentage of a team's bench players who are White, and the percentage of a team's starting players who are White. Customer discrimination implies a positive relationship between the team racial composition and the metro-area racial composition. Note that although we do not differentiate between American and foreign-born players, any reduced interest by American White fans in watching White European players would actually bias downward the implied importance of race in player allocation and attendance outcomes—and would, if anything, understate the value attached to U.S.–born White NBA players.[6]

We would, however, expect team racial composition to be more important in smaller metropolitan markets because such markets have fewer potential customers to fill an arena's seats. Assuming that some fraction of local customers pos-

sesses a propensity to discriminate, a team's management would be less likely to accommodate such customers if it could fill its arena seats with nondiscriminating customers. It is more likely that nondiscriminating customers are marginal demanders of seats when the market-area population is large relative to stadium size. In the regressions below, we account for this by entering the ratio of stadium capacity to total population in the market area as an independent variable. We expect a positive relationship between the ratio of stadium capacity to population and the percentage of White players on a team. A time-trend variable controls for time-dependent changes in the racial composition of teams.

Table 3 shows OLS regression results for the three dependent variables that measure team racial composition. As a determinant of overall team composition, the percentage White of the SMSA population (POPWHITE) is significant at the 95% confidence level. It is not significant in the bench regression, however, suggesting that the primary focus of customer discrimination is on starters (for whom this effect is significant at the 90% level).[7] The stadium capacity variable is significant at the 90% level in the team and starter regressions, whereas the time trend is significant at the 99% and 95% levels in the team and bench regressions, respectively, but not in the starter regression.[8] As documented earlier, the ratio of White to Black starters remained relatively constant throughout the decade.

## RACIAL MATCHING AND REVENUE GAINS

Basketball teams generate revenue primarily from two sources: television contracts and home-game attendance. The NBA bylaws and constitution require that teams pool and share television and cable revenue, but allow teams to retain all home-game attendance revenue (less a 4% assessment fee). For our purposes, the NBA's revenue-sharing arrangement is important because a substantial fraction of a team's revenue comes from local sources.[9] Accordingly, if customer demand for tickets depends on a team's racial profile, profit-maximizing managers will internalize the revenue impact of the local market's racial preferences.[10]

In a cross-sectional analysis, the empirical effect that team racial composition has on ticket revenue is complicated. Assuming that Black and White players are of equal performance quality, finding no relation between team racial composition (TWHITE) and ticket revenue is consistent with either of two hypotheses: (a) Fans are indifferent to race so that team race per se does not affect ticket revenue, or (b) fans are not indifferent but markets are in equilibrium with regard to race except for random errors. Similarly, finding a positive relationship between TWHITE and revenue also raises two possible interpretations: (a) Black players and White players are of equal quality, but customers are not indifferent to race and demand a greater percentage of White players on the team than managers supply; or (b) consumers do not care about race, but players are sorted among teams so that the average quality of White players on a team is positively correlated with the percentage of the team that is White (TWHITE).

TABLE 3: Models of Racial Composition of NBA Teams

| | *Percentage of Team White(TWHITE) %* | *Percentage of Bench White(BWHITE) %* | *Percentage of Starters White(SWHITE) %* |
|---|---|---|---|
| *Explanatory Variables* | *Coefficient (t statistic)* | *Coefficient (*t *statistic)* | *Coefficient (*t *statistic)* |
| POPWHITE: Percentage White of SMSA Population (%) | 0.14** (2.03) | 0.10 (1.05) | 0.19* (1.92) |
| STADIUMCAP/POP: Stadium Capacity/ Metro Population | 2.73* (1.87) | 3.14(1.58) | 4.02* (1.66) |
| TIME (0-8) | –0.01*** (–2.72) | –0.01*** (–3.18) | –0.00 (–0.25) |
| CONSTANT | 0.11** (2.26) | 0.19*** (2.82) | –0.03 (–0.42) |
| Adj. $R^2$ | .08 | .07 | .05 |

NOTE: The dependent variables in the models are (a) percentage of the team members who are White, (b) percentage of bench players who are White, and (c) percentage of the starters who are White. The *t* tests are based on robust standard errors. The results are based on 251 observations during nine seasons (1990-1999). Data on teams are from the *Official NBA Register* (Sporting News, various years); stadium capacity is from the NBA Web site (see www.nba.com), supplemented by telephone calls to teams to verify capacity in various years; population is total SMSA population from the U.S. Bureau of the Census and *County and City Extra: Annual Metro City and County Data Book* (various years), and for Canadian cities, Statistics Canada (see www.statcan.ca) and the Canadian Ministry of Finance (see www.bcstats.gov.bc.ca).
*$t$ statistic significant at .10 level; **$t$ statistic significant at .05 level; ***$t$ statistic significant at .01 level.

Applying these possible interpretations to our cross-sectional analysis of team racial composition, window dressing implies that the coefficient on TWHITE will be positive if all markets have similar demand for White players, and that the interaction effect between TWHITE and POPWHITE will be positive if demand for White players is higher in markets with larger White populations. Finally, if higher quality White players tend to play for teams with relatively high percentages of White players, then the cross-sectional coefficient on TWHITE will be positive due to the correlation between White player quality and TWHITE. To examine how these relationships have changed over the years of our study, we interact the measure of the racial mix of the team with a time trend (TIME).[11]

Table 4 presents two alternative specifications. We measure home-game revenue as average ticket price times average attendance at home games. We include variables to control for the effect of team winning percentage, the number of competing major professional sport franchises (NFL, NHL, and MLB), stadium capacity, SMSA average income, and SMSA total population. The significance tests are based on robust standard errors. Except for the income variable (whose significance falls to the 90% level in one instance), all control variables are significant at the 95% confidence level or better, and all have the expected signs. In addition, the time trend is significant and positive, reflecting both rising attendance and rising ticket prices during the 1990s.[12]

TABLE 4: Team Revenues From Home-Game Attendance

| | *Dependent Variable: Home Game Revenues* | |
|---|---|---|
| | *Model (1)* | *Model (2)* |
| *Explanatory Variables* | *Coefficient (Robust Std. Error)* | *Coefficient (Robust Std. Error)* |
| WINPER: Team winning percentage | 0.906*** (0.090) | 0.879*** (0.087) |
| COMPETITORS: Number of competing professional sports franchises in the city | –0.040** (0.020) | –0.044** (0.020) |
| STADIUMCAP: Stadium capacity (ln) | 0.919*** (0.108) | 0.912*** (0.108) |
| INCOME (ln) | 0.274* (0.141) | 0.314** (0.150) |
| POP: Total SMSA population (ln) | 0.140*** (0.043) | 0.166*** (0.043) |
| TIME: Time trend (1990 = 0) | 0.040** (0.019) | 0.039** (0.018) |
| TWHITE: Percentage of team White | –0.416 (0.286) | –1.370 (1.173) |
| TWHITE*TIME | 0.125** (0.062) | |
| POPWHITE: Percentage White of SMSA population | | –0.144 (0.381) |
| TWHITE*POPWHITE | | 1.278 (1.468) |
| TWHITE*POPWHITE*TIME | | 0.158** (0.075) |
| CONSTANT | –1.351 | –1.938 |
| Adj. $R^2$ | .65 | .66 |

NOTE: The models show the natural log of home-game revenue ($000), estimated as average ticket price times average attendance (TICKET PRICE * ATTENDANCE) as a function of explanatory variables, including the variables describing the racial composition of the team. The results are based on 251 observations over nine NBA seasons (1990-1999). Ticket price is average ticket price for home games during the regular season (on the Web site of Team Marketing Report, see www.teammarketing.com); attendance is from the *Official NBA Register* (Sporting News, various years) and the NBA Web site (see www.nba.com); winning percentage is from the *Official NBA Register* (Sporting News, various years); competitors is number of professional sports franchises (MLB, NBA, NFL, and NHL) in the SMSA area and is available from Web sites for the pro sports leagues (see www.mlb.com, www.nba.com, www.nfl.com, and www.nhl.com); income and population data are from the U.S. Bureau of the Census and *County and City Extra: Annual Metro City and County Data Book* (various years), and for Canadian cities, Statistics Canada (see www.statcan.ca) and the Canadian Ministry of Finance (see www.bcstats.gov.bc.ca).
*$t$ statistic significant at .10 level; **$t$ statistic significant at .05 level; ***$t$ statistic significant at .01 level.

The first regression is the most parsimonious and includes the percentage of team members who are White (TWHITE) as an independent variable along with TWHITE interacted with the time trend (TWHITE*TIME). The coefficient on TWHITE is insignificant, but the interaction with time is positive and significant at the 95% confidence level. The time interaction allows us to evaluate how revenue varies with changes in time in team composition. According to this first set of results, and ignoring statistical significance, TWHITE had a negative total effect on revenue (the implied coefficient is –0.416) during the 1990-1991 season. This suggests an excess supply of White players relative to demand but is also consistent with the hypothesis that White players, on the margin, were of lower quality than

Black players. In contrast, during the 1998-1999 season, TWHITE had a positive impact on revenue (the implicit coefficient is 0.584, i.e., –0.416 + 8*0.125). As discussed above, the positive coefficient supports both hypotheses of customer discrimination: that fan demand for White players exceeds the supply, and that teams with higher concentrations of White players also have higher caliber White players.

The second specification uses an alternative measure of racial mix: the interaction between the percentage of the team that is White and the percentage of the SMSA population that is White (TWHITE*POPWHITE). We also include POPWHITE on its own as well as interacting the matching variable with time. The results are generally in line with those of our first specification: The statistical and economic importance of racial matching becomes more pronounced throughout time and gives rise to similar-sized incremental revenues when evaluated at the White population mean. The driving factor is clearly the interaction with the time trend.[13] As shown in Table 4, this compound variable is significant at the 95% level, and the positive sign supports the hypothesis that higher quality White players go to teams with larger White SMSA populations. Furthermore, the 1998-1999 results imply that customers discriminate in conjunction with White-player undersupply—higher quality White players go either to the whiter teams or to cities with higher White populations.

## "SORTING" OF WHITE AND BLACK PLAYERS AND PLAYER MOVEMENT

The preceding results certainly suggest that the player selection process has resulted in the better White players (the "stars") locating in cities with larger White populations. Using a composite of the five performance measures considered earlier in the article, we examine the cross-sectional differences in these performance measures. The five performance statistics (assists per minute, blocks per minute, field-goal percentage, points per minute, and rebounds per minute) are first standardized by the mean of the sample for that statistic. We then equally weight and sum the standardized statistics to arrive at the composite performance index for a player.[14] Regressing the overall performance measure (PERFORM) on the player's race (RACE is defined as 1 if the player is White and 0 otherwise), the percentage of the population in the team's market area that is White (POPWHITE), and the interaction between RACE and POPWHITE yields the following result for the 1996-1997 through 1998-1999 seasons:[15]

$$\underset{\phantom{(1.136)}}{\text{PERFORM} = 3.526} \underset{(1.136)}{- 2.622^{**}\ \text{RACE}} \underset{(0.687)}{- 0.730\ \text{POPWHITE}} \underset{(1.485)}{+ 2.743^{*}\ \text{RACE*POPWHITE}}$$

where robust standard errors are in parentheses, and * and ** denote significance at the .10 and .05 levels, respectively.

TABLE 5: Probit Regression of the Impact of Team and Market Area Racial Mix on Team Choice to Retain a Player

| *Explanatory Variables* | *Coefficient* | *Robust Std. Error* |
|---|---|---|
| $TWHITE_{1T}$: Percentage of (year 1) team who are White | –1.372*** | 0.548 |
| $TWHITE_{0T}$: Percentage of (year 0) team who are White | 0.143 | 0.580 |
| $POPWHITE_{1T}$: Percentage White of (year 1) SMSA population | 0.557 | 0.581 |
| $POPWHITE_{0T}$: Percentage White of (year 0) SMSA population | 1.003* | 0.573 |
| RACE: Player's race (1 = White) | 2.207** | 1.038 |
| $TWHITE_{1T}$ * RACE | 0.119 | 1.244 |
| $TWHITE_{0T}$* RACE | –2.536* | 1.323 |
| $POPWHITE_{1T}$* RACE | 0.515 | 1.420 |
| $POPWHITE_{0T}$ * RACE | –2.672** | 1.331 |
| CONSTANT | –0.955*** | 0.423 |

NOTE: The sample consists of all player-team affiliations during three seasons: 1996-1997, 1997-1998, and 1998-1999. To be included in the sample, the player must be observed for more than one season so that comparison data are available for both the original-period team and the subsequent-period team. Hence, a player is observed each time he has a team affiliation during the three seasons, including midseason changes in affiliations. We then observe whether the player changed affiliations or remained with the previous team. If the affiliation changed, the observation includes demographic data on both the original team ($TWHITE_{0T}$) and host city ($POPWHITE_{0T}$) and the new team ($TWHITE_{1T}$) and host city ($POPWHITE_{1T}$). If the affiliation did not change, then the observation includes Time 0 and Time 1 team and city data for the original team. The dependent variable equals 1 if the player is observed moving to a new team between Time 0 and Time 1, and it equals 0 if the team retains the player for the Time 1 season. Data sources appear in previous tables.
***Significant at .01 level; **significant at .05 level; *significant at .10 level.

The regression coefficients provide suggestive evidence that, in the last three NBA seasons in the 1990s, the performance of White players was higher in cities with larger White populations. In combination with the Table 4 results, this implies that better-performing White players have navigated toward locations that place a higher premium on their performance.[16] Such a result is consistent with customer discrimination, although of a more limited type than was documented in studies using 1980s data. This "sorting" can of course only be achieved through player movement, implying that the trading of White and Black players should also be influenced by the racial composition of the team and the racial composition of its market area. Table 5 reports the results (from the 1996-1997 through 1998-1999 seasons for which we have data on player trades) of testing this proposition by modeling the probability that a player will be traded to a new team as a function of the percentage White on the old and new teams, the percentage White in the old and new teams' market areas, the player's race, and interaction between the player's race and each of the team and market-area variables.

We find that White players are significantly more likely to be traded than are Black players. Black players are more likely to be traded *from* a team located in a city with a relatively large White population and are less likely to be traded *to* a team

with a high percentage of White players. Relative to Black players, White players are significantly less likely to be traded *from* a team located in a city with a relatively large White population and are less likely to be traded *from* a team that has a large percentage of White players. Taken together, these findings seem consistent with the implications drawn from Table 4 on the sorting of players by race—that is, toward the end of the decade, teams in whiter areas seem to place greater emphasis on retaining any White players they had.

There is still a question as to whether the teams or the players determine how this sorting actually occurs. Researchers typically assume that the teams' preferences are dominant. Nevertheless, we acknowledge that player preferences may affect location. In an extreme expression of such player preferences, Isaiah Rider, a Black Trailblazer team member, called the relatively White city of Portland a "racist area" (Wertheim, 2001, p. 44). Despite its shock value, this quote offers support for the premise that team preferences are what ultimately matter most. Rider remained with the Portland Trailblazers for three seasons and, after becoming a free agent, eventually signed with the Denver Nuggets in October 2001—another team located in a smaller NBA city not noted for having a large Black population. The implication is that players may have preferences for particular teams, but in a competitive market for players, they do not have sufficient market power to select teams and teammates that match their individual preferences.[17] We leave open, however, the possibility that some players, most likely top-performing starters, have sufficient market power to select among NBA teams.[18]

## CONCLUSIONS

Evidence from the 1990s is mixed on whether basketball fans are becoming indifferent to the race of NBA players. Clearly, the NBA and its franchised teams have prospered in the 1990s, as both revenue from televised games and arena attendance have increased steadily. These increases have occurred at the same time that Black player participation has increased and White player participation has decreased. Furthermore, our results on player performance suggest that NBA teams tend to use the most talented players regardless of race. It may be premature, however, to conclude that fans do not care about race. The tendency of teams in whiter areas to have more White players certainly has *not* disappeared since the 1980s. We continue to see a nonrandom sorting of players among teams from our 1990-1999 sample period. Moreover, after correcting for other factors, we find that a matching of the team's racial composition and the racial composition of the market area positively boosts home game–attendance revenue. One interesting characteristic of this sorting is that more skilled White players appear to end up with teams located in markets with relatively larger White populations. In general, White players are also less likely to be traded away from teams that have either a larger White concentration in their market area or a larger concentration of White players on the

team. Thus, not only do White players seem to congregate in teams playing in Whiter cities, but those same teams are most loath to trade them away.

## NOTES

1. Early studies using 1970s data find similar results. See Markmann (1976) and Karabel and Karen (1982).

2. Discrimination by customers may have an impact not only at the professional level but also at the college basketball level. Brown and Jewell (1994, 1995) found that White players in the 1988-1989 NCAA season generated significantly more team (school) revenue than did Black players of comparable ability.

3. Classifying players according to their playing position does not alter the overall picture apparent in Table 2. Results are provided in a separate appendix that is available from Janet Smith (e-mail: janet.smith@claremontmckenna.edu). Because team managers do not select players based on only one skill, we also examined whether there is any difference in the breadth of skills that Black players and White players possess on average. Correlations between pairs of performance measures are the same sign and of similar magnitudes for Whites and Blacks.

4. Hoang and Rascher (1999) also found evidence of *exit discrimination* in the 1980s with White players facing 36% less risk of being cut from a team than did Black players with otherwise similar characteristics. As Kahn (2000) documented, however, data from the early to mid-1990s generally offer much less support for salary discrimination against Blacks in the NBA (see, for example, Bodvarsson & Brastow, 1999; Dey, 1997; Gius & Johnson, 1998; Hamilton, 1997).

5. Bodvarsson and Partridge (2001) also pointed to possible coworker discrimination through the effect of team composition on salaries. They found that White players are paid more, ceteris paribus, when the team becomes less White. It is not clear, however, whether any such effect really implies coworker discrimination. It could instead reflect an attempt by teams to maintain at least some measure of ethnic diversity. Former owner of the Cleveland Cavaliers, Ted Stepien, even went on record claiming: "You need a blend of black and white. I think that draws, and I think that's a better team" (see Karabel & Karen, 1982, p. 24).

6. It is also possible that prejudiced Black fans may have less interest in seeing foreign-born Black players on the team, again mitigating *against* finding significant effects of race in our empirical analysis.

7. We also estimated the relationships using clustering (where each of the 29 teams is a cluster) to consider the possibility that observations are not independent within clusters. The results comport with those in Table 3, although the coefficients are less significant. For the first equation, encompassing all players, the coefficient on POPWHITE is significant at the 0.25 level. When we estimate just on the first and last years of data, where clustering is less of an issue, the coefficient on POPWHITE is significant at the 0.01 level. When we do allow for clustering in these years, the coefficient is significant at the 0.15 level.

8. Our empirical finding (of a statistically significant relationship between the racial composition of teams and the racial composition of corresponding metropolitan areas) holds whether or not we exclude the two expansion teams, for which data are available from 1995 onward.

9. Although the influence of national broadcasting revenue has grown in recent years, more than 65% of the average NBA team's revenue still came from local sources in 1996 (Wilson, 2001). Teams receive all revenue from the sale of tickets to regular-season home games (subject to the NBA gate assessment of 4%) and no revenue from sale of tickets to regular-season away games. Generally, teams also retain all revenues from the sale of tickets to home exhibition games. Based on SEC annual report filings by the Boston Celtics, we find that during the period 1993-2000, ticket sales represented 49.3% of total revenue and TV revenues represented 39.3%. Other sources of revenue made up the remainder.

10. Looking at Nielsen ratings for local broadcasts of NBA games during the 1996-1997 season, Kanazawa and Funk (2001) found that these ratings were positively related to the number of White players represented on the two teams. A qualification is that the Chicago Bulls, shown in our Table 1 to be the whitest NBA team during the 1990-1999 period, may have boosted the Nielsen ratings not only through the Bulls' racial profile but also by featuring the returning superstar Michael Jordan. Thus, the findings of Kanazawa and Funk for the 1996-1997 season may to some extent conflate a fan response to greater White representation with a "Michael Jordan effect." That is, the importance of superstar prowess may well have transcended race in this case.

11. We interact team White with time rather than using a random-effects model because of the degrees of freedom limitations. The restriction appears to be reasonable given the systematic change (approximately linear) in team composition apparent from Figure 1.

12. Again, results are not sensitive to inclusion of the two expansion teams, Toronto and Vancouver.

13. Similar results are obtained if we enter the ratio between TWHITE and POPWHITE in place of the interaction. The insignificance of either of these matching variables when not interacted with time is consistent with the negative results noted by Berri, Schmidt, and Brook (2004) in their gate-revenue regressions based on data from the 1992-1993 through 1995-1996 NBA seasons.

14. As noted, extant studies of NBA player salaries show that these five variables (points scored, total rebounds, assists, blocked shots, and sometimes shooting efficiency) are the statistically significant determinants of salaries. Other productivity factors (e.g., free-throw percentage, steals, and offensive rebounds) are not statistically significant in salary regressions. The studies, however, do not yield clear guidance as to the relative weights of these variables. See Berri (2003), who reported on evidence from 11 salary studies.

15. We do not run this regression for starters and bench players separately due to the small number of White player observations.

16. Recent evidence on salary distribution in the NBA shows that, even though the overall Black-White wage differential appears to have diminished, the degree of dispersion in NBA wages nevertheless increased during much of the 1990s. Hill and Groothuis (2001) showed that whereas the mean NBA salary rose approximately 78.5% between the 1993-1994 and 1997-1998 seasons, the median salary increased by just 31.3%. Hamilton (1997), examining salary data in the mid-1990s, found evidence that at the upper end of the salary distribution (75th and 90th percentiles), Whites earn more than their Black counterparts, although Hamilton found no statistical difference in salary at lower percentiles.

17. Meanwhile, teams' abilities to bid freely for the players they want do not seem to have been constrained in any meaningful way by the post-1983 "salary cap," because there are numerous exceptions to this limit—including the "Bird Exception," which allows a team to acquire players from others teams up to the level of the salary cap and then freely bid *above* the salary cap to keep any of its own players who have become free agents (Hill & Groothuis, 2001, p. 133). Wage setting in the NBA does seem to have been significantly altered by the subsequent 1998 collective-bargaining agreement, with Hill and Groothuis (2001) documenting a reduction in wage dispersion after this new policy took effect. This could have no more than a minimal impact on our empirical work, however, because we end our sample in 1999.

18. Analysis of team draft picks could offer a means of more definitively separating team preferences from player preferences.

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