

Moving on Up: The Rooney Rule and Minority Hiring in the NFL*

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Abstract

Detecting and quantifying racial discrimination in the labor market is difficult. The sports industry offers a wealth of data and specific hiring practices which mitigates this difficulty. The Rooney Rule requires National Football League teams to interview at least one minority candidate when hiring a head coach. We examine a unique data set of high-level assistant coaches (offensive and defensive coordinators) from the beginning of the 1970 season through the beginning of the 2009 season to determine whether race is a factor in NFL teams' decisions to promote these assistants to head coach. Using logit and hazard models that control for age, experience and performance, we conclude that conditional on a coach reaching coordinator status, there is no evidence that race influences head coach hiring decisions. We also find no evidence that the Rooney Rule has increased the number of minority head coaches.

Keywords: Labor, Discrimination, Race,

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1 Introduction

As emphasized in Goldin and Rouse (2000) and Bertrand and Mullainathan (2004), the conventional methodology for examining racial or gender bias in the labor market (i.e., estimating statistical models using survey data) may not adequately capture the true effects of discrimination. This is because standard labor force statistics (e.g., education and experience) may not reflect the capabilities of the applicant, nor does it contain all the data that employers observe when making hiring decisions, such as the total supply of applicants.

We study the question of discrimination in the market for NFL head coaches, which mitigates these critiques for two reasons. First, a majority of the head coaches in the NFL served as either defensive or offensive coordinators (level-two coaches) before becoming head coaches. Therefore by examining the movement from level-two coaches to head coaches, we have some measure of the supply of applicants when a head coaching job becomes available. That is, we are able to determine if a deserving level-two coach is *not* promoted to head coach due to racial discrimination. Second, we have relatively accurate measures of the productivity. Unlike the typical statistical model of discrimination (see Altonji and Blank (1999)) which may omit certain unobservable characteristics important for employment decisions, the productivity of level-two coaches can be measured by “points allowed” for defensive coordinators and “points scored” for offensive coordinators. Thus we echo the sentiment of Kahn (2000), in that the sports industry offers a unique opportunity to study labor market discrimination.

Although Super Bowl XLI in 2007 was the first National Football League (NFL) championship game to feature two African-American head coaches, racial equity in football hiring decisions remains a contentious issue. High-profile figures in discrimination law, such as lawyers Cyrus Mehri and the late Johnnie Cochran, as well as in sports, such as the late Myles Brand, have pushed to increase the numbers of minority head coaches in both professional and collegiate football. Following an analysis commissioned by Cochran and Mehri in early 2002 which concluded that minority coaching candidates were unfairly discriminated against in the NFL, the NFL instituted an anti-discrimination policy known as “The Rooney Rule.”¹ This policy requires NFL teams to interview at least one minority candidate any time their head coaching position comes open. Since the Rooney Rule’s establishment, the number of African-American head coaches among the 32 NFL teams has increased from two to six currently (peaking at 7 head coaches in 2006), and 12 African-Americans have held head coaching positions for at least one NFL season.²

¹The rule is named for Dan Rooney, the owner of the Pittsburgh Steelers and the chairman of the NFL’s diversity committee.

²At a 2009 meeting, the NFL owners discussed extending the Rooney Rule to cover the hiring of general

Those who assert bias in NFL hiring practices typically note that the limited number of minority head coaches occurs despite the fact that roughly 65 percent of NFL players are African-American (see, e.g., Lapchick (2007)). The implicit suggestion that this is evidence of discrimination, presumably because minority players are prevented from moving into coaching, does not follow. NFL playing experience is neither a necessary nor a particularly common qualification for coaching in the league. For example, of the 32 head coaches that started the 2009 season, only 7 (22 percent) had significant professional playing experience. This is equally true for minority head coaches; of the 6 that started the 2009 season, only one (17 percent) was a former NFL player. Nor is it clear that the Rooney Rule is an effective way of increasing the proportion of minority coaches. A team that wished to discriminate on a racial basis could do so without violating the rule by interviewing a minority candidate whom it had no intention of hiring, before hiring a candidate of the preferred race. Although the policy is often credited for the increase in the number of minority head coaches, that increase could also be result of other factors, including the development of assistant coaches that are excellent candidates for promotion.

In this paper, we examine the impact of race on the hiring of NFL head coaches and the impact of the Rooney Rule by estimating models of high-level assistant coach tenure and whether they end with promotion to head coach or other separation. We focus on high-level assistant coaches (offensive and defensive coordinators) because they are the most common source of head coaching candidates, and because we are able to construct measures of their performance. Football is unique in that the coaching structure designates one individual chiefly responsible for defense, and another responsible for offense. This allows us to measure the performance of assistant coaches based on team points scored for offensive coordinators, and based on team points allowed for defensive coordinators. Using data that cover the period from 1970 through the beginning of 2009, we estimate logit models which have as the dependent variable the probability of promotion. We also estimate hazard models of assistant coach promotion. We first test for racial differences in the probability of promotion and time to promotion to head coach, controlling for other variables including performance, age and experience. We then examine the effect of the Rooney Rule on the probability of promotion of White and minority coaches. We conclude that conditional on a coach reaching coordinator status, there is no evidence that race influences head coach hiring decisions. We also find no evidence that the Rooney Rule has increased the number of minority head coaches.

managers as well.

2 Related Literature

Race and gender differentials in the labor market are well documented, but understanding the reasons behind such large and persistent differences is still an area of active research (see Altonji and Blank (1999)). Recently, economists have used first names to control for racial discrimination in examining lifetime outcomes such as financial status, social class, occupational prestige, etc. [Bertrand and Mullainathan (2004), Fryer Jr and Levitt (2004)]. Aura and Hess (2010) find evidence that “blackness” of a name (fraction of people with that name who are Black) is a significant predictor of economic outcomes. The advantage of this approach is that productivity of an individual is obviously independent of their name. And therefore if a particular first name is a significant predictor of economic status, then discrimination must be playing a role. While we focus on a much smaller labor market, our approach has similar advantages. We are able to control for the productivity of individuals directly. Therefore if race plays a role in hiring or firing decisions, it must be due to discrimination.

While much has been written about racial discrimination against players in various sports, few studies have focused on coaches and even less has been done on the issue of discrimination in hiring and promotion of coaches. Scully (1989) examines why so few minority baseball players become managers. He finds that the position played is significant in determining the probability a player will become a manager. Kahn (2006) examines pay and retention of NBA head coaches from 1996 to 2003, and finds small and statistically insignificant racial differences after controlling for team and coaching quality. In a study that focuses on which baseball players are most likely to become coaches, Singell (1991) estimates a probit model and finds that, controlling for years of playing experience, position played, measures of performance, age and time trends, Black players had a lower probability of becoming a coach initially, all else equal, but that the probabilities of Black and White players becoming coaches were converging over time.³ Mixon and Trevino (2004) consider the impact of race on the decision to retain or dismiss NCAA football coaches. Using a hazard model and data from 81 universities from the major football conferences from 1990 to 2000, they find that Black coaches had a probability of dismissal that was nearly 10 percentage points lower than that for White coaches, after controlling for the coaches’ cumulative winning percentage, participation in pre- or post-season games, and improvement in team record over the previous year. They conclude that Black college head football coaches are given more time to succeed than their White counterparts, all else equal.⁴

³We use the terms “Black” and “African-American” here following the usage of the particular author. We use the term “African-American” in describing our own results.

⁴One must be careful to draw too strong an inference from these results, however, as Black college head football coaches were very rare in this sample; of 886 coaching-years of observations, only 3.8 percent, or

Madden (2004), in the study commissioned by Mehri and Cochran, examines the links between race and performance of NFL head coaches between 1990 and 2002. Using simple t -tests and with little control for other variables, she finds that African-American coaches performed better in the first year of their hiring, performed better on average for the duration of their tenure, and performed better in the last year of their tenure than white coaches. While provocative, Madden’s analysis does not provide direct evidence on the hiring question, but can only suggest inferences from head coaching performance; she concludes that, since African-American NFL head coaches perform better than their White counterparts, they must be held to a higher standard in order to obtain their positions.

Madden and Ruther (2010) conclude that the implementation of the Rooney Rule has “likely eliminated” the racial disadvantage faced by African Americans with respect to NFL head coaching positions. This conclusion is based largely on the finding that the differences in performance by race for existing head coaches observed prior to 2003 are not present in the post-Rooney Rule data. We look instead at the hiring outcomes for high-level assistant coaches; using logit models, competing hazard models and a Oaxaca decomposition of differences in hiring probabilities into performance characteristics and race, we find little support for the proposition that highly qualified minority candidates have been overlooked when NFL teams hire head coaches or that the Rooney Rule has successfully increased the number of minority coaches. Interestingly, when they do examine racial differences in hiring from the pool of defensive coordinators, Madden and Ruther find no evidence of racial discrimination either before or after the imposition of the Rooney Rule.⁵

A recent paper by Goff and Tollison (2009) examines how characteristics of teams and their home cities have affected the pace of integration of NFL head coaching positions. The results are mixed; population, per capita income and percentage of the population that is Black all have statistically significant coefficients, but higher income and Black percentage make it less likely that a city’s team has a Black head coach, and the city’s education level has no statistically significant effect on that probability. Longer-tenured owners are also less likely to hire Black head coaches. The model is estimated using data from 1987 to 2007, but there is no control for the imposition of the Rooney Rule during this time period. Goff and Tollison ultimately conclude that the Black head coaches who broke the color barrier were simply successful assistant coaches.

In a paper that is most similar to the analysis presented here, Fee, Hadlock, and Pierce

 about 34 coaching years, were attributable to Black head coaches.

⁵It is not clear whether Madden and Ruther (2010) extend their data to include all minorities or focus exclusively on African-American candidates, and whether they include all high-level assistant coaches or only those with the title of offensive or defensive coordinator. The Rooney Rule applies to all minority candidates, and some high-level assistants, including some African-Americans, have titles other than coordinator.

(2006) focus on the factors that affect internal versus external hiring of NFL coaches. Their results, based on logit regression models with data from 1970 to 2001 which control for coaches' performance (in the case of promotions), age, experience with the team, and team performance, point to potentially important differences between the processes by which high-level assistant coaches are promoted to head coach and head coaches are hired from outside. Fee et. al. find little evidence of race affecting either the promotion of assistant coaches to head coach positions or the dismissal of head coaches; to the extent there is any indication that race matters, their results point to a slightly higher likelihood of promotion and a slightly lower likelihood of demotion for Black assistant coaches. Again, their sample includes a relatively small number of minority assistant coaches, and ends before the Rooney Rule was established.

3 Data and Variable Definitions

We start with the database of Fee, Hadlock, and Pierce (2006), and extend it to cover the period through the 2009 season. Specifically, we have a complete set of information on who held coaching positions for the 1970 through the beginning of the 2009 season. This is comprised of all individuals employed by NFL teams who serve as head coach, or offensive or defensive coordinator (some of the latter have titles like "Assistant Head Coach - Offense"). This enables us to examine the coaching transitions which took place prior to the 1971 to 2009 seasons. Our data set has 3,077 observations, each comprising a coach-year. The coach-years are spread out over 1,157 franchise-years, for an average of 2.66 coaches per franchise per year. In recent years, teams have expanded their staffs (e.g., the 2007 Washington Redskins had five coordinator-level coaches in addition to a head coach), but the average coaches per franchise per year remains below the expected three due to early NFL teams frequently having only a head coach and minor assistants. Due to these variations in the conventions for naming coaching positions, we place greater confidence in results based on data limited to 1990 and later. Tables 1 and 2 present summary statistics for both the original Fee, et al. dataset (F-H-P) and our extended dataset (S-S-W), for Head Coaches, Offensive Coordinators and Defensive Coordinators respectively.

We track each assistant coach over time, noting when they cease to hold the position of offensive or defensive coordinator. At that point, we check to see whether they appear in the data as a head coach in the following year. If so, the last year in which they were an assistant coach is designated as a promotion year. If they do not appear in the data for the next year, the last year in which they were an assistant coach is designated a separation year; we do not differentiate between voluntary separations (quits) and involuntary separations

(firings and demotions). If the assistant coach changes teams but remains at the assistant coach level, we do not consider this either a promotion or a separation.

By only conditioning on the promotion of level-two coaches we are not controlling for *all* qualified applicants, which might bias our estimates. However, we believe that this bias is negligibly small. A majority of head coaching vacancies have been filled by level-two coaches or coaches who have had some NFL experience. Data from 1970 to 2001 reveals that only 1 in 4 head coach hires comes from non-NFL sources. More recently, from 2001 through 2009, there were 44 head coach transitions. Of those, 25 were filled by NFL coordinator-level coaches, 5 filled by lower level coaches, 5 by NFL head coach to head coach move, 4 by former NFL head coaches that were unemployed at the time, and 5 moves from college head coach to NFL head coach. Moreover, we believe that for most of the past two decades, the NFL has been more receptive to high-level minority coaches than college football. We define a “high-level” coach as someone who has a legitimate chance for a head coaching position in the NFL. For the college ranks this typically restricts the sample to head coaches only. The peak in the number of minority head coaches in Division I college football was 8 out of 119 schools in 1997 [Lapchick (2008)] and 2009-10 had only 4 minority head coaches. In contrast, the NFL had 7 minority coaches out of 32 in 2007, and saw a 200% increase in minority assistants from 1991 to 2006. For the 2008-09 season, the NFL had 14.9% minority coordinators.

It is not uncommon for a coach to be promoted from assistant coach to a head coaching position, only to lose that job at some point and re-enter the coaching ranks at a level-two position. Including these subsequent instances in the sample introduces additional heterogeneity and potential omitted variable bias, as prior head coaching experience and performance are factors that would be expected to influence head coach hiring decisions. Rather than attempt to include those variables, we restrict our analysis to assistant coaches who have not yet held head coaching positions; this includes assistant coaches who are never hired as head coaches, assistant coaches who are hired as head coaches only once, and the first hiring as a head coach for those who are hired from an assistant coaching position to a head coaching position multiple times.

We control for six independent variables in our model. We use percentile rank in points scored and points allowed to measure the performance of offensive and defensive coordinators respectively. That is, in each year the offensive coordinator whose team scored the most points, and the defensive coordinator whose team gave up the fewest points, is assigned a performance ranking of one, and the offensive and defensive coordinators whose teams had the poorest performance that year is assigned a ranking of zero. Following Fee, et. al., we use percentile rank rather than raw data on points scored or allowed in order to

account for changes in the league scoring environment over time. We use two variables to control for human capital. The first is the coach’s age at the beginning of the season. The second variable is a measure of a coach’s high-level coaching experience. For every year a coach spends as an offensive coordinator, defensive coordinator, or head coach, the experience variable increases by one. Coaches are not given credit for years spent as a low level assistant. Departing from Fee et al., we do not reset the experience variable if a coach changes teams. Our goal is to measure human capital gained from coaching, rather than examining relationship-specific human capital. When considering the transition from assistant to head coach, relationship-specific human capital becomes less important because the relationship disintegrates when the promotion occurs in every circumstance due to head coach departure or the ascending assistant changing teams. We also use a time trend in some regressions, using a year variable which is given by the calendar year minus 1970. The final two variables we control for are race and coordinator responsibilities. Based on the requirements of the Rooney Rule, the race variable is a dummy variable where White coaches are coded as zero and all minority coaches are coded as one. The minority coaches in our data are predominantly African-American, with Norm Chow (Asian-American) and Tom Flores and Ron Rivera (Hispanic) the exceptions. The coordinator variable is a dummy variable coded as zero for defensive coordinators, as one for offensive coordinators, and left blank for head coaches. We include this variable to control for any tendency of teams towards hiring coaches who are more offensive or defensive minded.

4 Results

We examine several different models to determine whether race influenced promotion decisions from a level-two coach to head coach. The results do not suggest that race is an important factor in hiring decisions. However, experience, age, and performance of a level-two coach are significant factors in hiring decisions for NFL teams.

4.1 Logit Results

The first model we examine is a simple logit. The logit results are based on promotion from a defensive or offensive coordinator position based upon 1457 observations. The model is given by

$$Pr[Y_j = 1|X_j, \alpha, \beta] = [1 + \exp(-\alpha - \beta X_j)]^{-1}.$$

Table 3 presents the marginal effects of performance, age, race, year, experience and

offense/defense based on the results of the logit model, with effects for the dummy variables based on a discrete change from 0 to 1 for various model specifications, and where the marginal effects are calculated at the point of means for all variables except performance, which is set at the 90th percentile.⁶ Model 1 of table 3 is estimated for the entire sample from 1970–2009. At mean performance, the marginal effect of performance is large, positive and statistically significant at the 10 percent level, but the predicted probability of promotion is small. This is as expected; given the infrequency of promotion opportunities and the fact that we have excluded assistant coaches with prior head coaching experience, the likelihood that an assistant with average performance would be promoted to head coach should be small. Even at the 90th percentile of performance, the predicted probability of promotion is only 0.061.

As expected, higher performance and greater experience increase the probability of promotion, with performance having the stronger effect. Greater age, on the other hand, reduces the probability of promotion; an older assistant coach who has no head coaching experience is less likely to be promoted than a younger assistant with similar performance and experience. Being an offensive coordinator increases the probability of promotion, and the year variable indicates a downward trend in the probability of promotion, although these effects are small and only marginally significant. Of particular importance to us here, there is no evidence that race plays any role in the promotion of NFL head coaches. The marginal effect of being a minority, while negative, is small and not statistically significant. Model 2 of table 3 shows that the results remain essentially the same when we omit the year and offensive/defense variables.

One concern could be that the performance measure being used is a noisy indicator of true performance. For example, teams with excellent general managers or high budgets may be able to procure the most talented individuals, making both offensive and defensive coordinators appear very productive. Alternatively, a good defensive coordinator may have a high-scoring defense, which in our data, would be attributed entirely to the offensive coordinator. This correlation across coordinators on the same team (0.36 correlation in the data) could lead to biased results. Following Fee, Hadlock, and Pierce (2006), we account for this potential bias by regressing the performance variable for each level-two coach against the performance variable for the coach’s counterpart(s) on the same team. That is, the offensive coordinator’s performance variable is regressed against the defensive coordinator’s performance variable, and vice versa. The residuals from this regression should be free from correlation, and are then used as performance measures in the logit estimation. Model 5

⁶Recall that the interpretation of the marginal effect is the derivative of probability of promotion with respect to the estimated coefficients. The standard errors are calculated using the delta method.

of table 3 presents the results of this robustness check and finds that our conclusions are unchanged.

4.2 Hazard Model Results

A problematic assumption made in estimating the logit model is the independence of the errors. Our data set is a panel data set and in order to estimate the logit model, we stack the panel and treated each observation as independent. It is obvious that if there is unobserved heterogeneity associated with each individual then this assumption is incorrect. The errors associated with each coach will be serially correlated. Indeed, this could lead to biased standard errors and is not the most statistically efficient use of the panel.

One possible method to handle this problem is to estimate a hazard model. We first estimate a Cox proportional hazards model with survival time of each coach assumed to follow its own hazard, $\lambda_i(t)$ given by

$$\lambda_i(t) = \lambda(t; X_{i,t}) = \lambda_0(t) \exp(X'_{it}\beta)$$

Table 4 shows that employing this more sophisticated model does not change the underlying results. Table 4 models 1 and 2 are estimated based on 1143 observations comprising 252 assistant coaching spells, of which 71 ended in promotion to head coach and the remainder are treated as right-censored. Model 2 does not distinguish between OCDC positions. At the 90th percentile for performance and the point of means for other variables, the predicted relative hazard is 0.125. Higher performance, greater experience and being an offensive coordinator increase the relative hazard of promotion, with performance having the strongest effect, while greater age reduces the likelihood of promotion, all else equal. As in the logit model, the results do not provide much support for the hypothesis that being a minority reduces the likelihood of promotion; although the marginal effect of race is negative, it is still not statistically significant.⁷ These results are virtually unchanged when the offense/defense variable is omitted.

We next estimate a competing hazard model, in which an assistant coach's tenure can end either in promotion to head coach or termination. In the latter event, we do not distinguish between voluntary (quit) and involuntary (fired) termination. The results are presented in table 4 model 3, and are again based on 1143 observations comprising 252 assistant coaching spells, of which 71 ended in promotion to head coach, 144 ended in termination, and the

⁷Although the marginal effects that we present are often not statistically significant, the estimated hazard model regression coefficients on performance, age and experience are always significant at the 95 percent confidence level, the coefficients on offense/defense are sometimes marginally statistically significant, and the coefficient on race is never statistically significant.

remaining 37 were right-censored. At the same point of evaluation, the predicted relative subhazard for promotion is 0.859. The results are similar once again; higher performance, greater experience and being an offensive coordinator increase the probability of promotion, while greater age and being a minority reduce it, but the latter effects are weakest. The results for termination, presented in column Model 3: Quit/ Fire, are based on 842 observations comprising 237 assistant coaching spells, of which 153 ended in termination, 57 ended in promotion, and the remaining 27 are right-censored. The predicted relative subhazard for termination is 83.16, reflecting the considerably higher probability that assistant coaches' employment ends through quitting or being released. The results indicate that higher performance reduces the probability of being terminated, while greater age, experience and being an offense coordinator increase that probability. Being a minority increases the probability of termination all else equal, but the effect is extremely small and not statistically significant at even very small confidence levels.

4.3 Blinder-Oaxaca Decomposition

As a check on the robustness of our results, we applied the Blinder-Oaxaca decomposition to a logit model which includes performance, age, year, experience and offense/defense coordinators.⁸ The Blinder-Oaxaca decomposition is well known in the discrimination literature and decomposes the probability of promotion into two components: [i] a portion that arises because different groups, on average, have different qualifications and [ii] a portion that is due to discriminatory behavior. As shown in table 5, in our sample the log odds of promotion is 0.0592 for White assistant coaches and 0.0446 for minority assistant coaches, yielding a difference of 0.0146. Of this gap, about 0.0139 or roughly 95% can be explained by differences in the explanatory variables, while only 0.0007 or about 5% is left to be explained by discrimination or omitted variables; we cannot reject the hypothesis that this contribution is zero.⁹ Therefore, the Blinder-Oaxaca decomposition provides a definitive statement of our primary finding: conditional on level-one and level-two coaching data from 1970 through 2009, the effects of discrimination are insignificant when assessing the probability of promotion to head coach.

⁸We thank an anonymous referee for suggesting the Blinder-Oaxaca decomposition.

⁹This result was generated using the Stata implementation of the Blinder-Oaxaca decomposition by Jann (2008), using methods derived by Yun (2005); see also, Fairlie (2005).

4.4 The Effect of the Rooney Rule

To examine the effect of the Rooney Rule, we split the data into a pre-Rule (1990-2002) and a post-Rule (2003-2009) period, and compare the effect of race across the two periods. We choose the starting point of the pre-Rule sample to make the proportions of minority observations more comparable across the time periods. Due to the small number of assistant coaching spells and the extent of left-censoring in the post-Rule period, it is difficult to obtain convergence of the maximum likelihood estimator for the hazard models after 2003. Hence, we restrict our analysis to the logit model; Table 3, models 3 and 4 show the marginal effects for the two periods. The predicted probability of promotion is small in both cases although increases substantially in the post-Rule era (0.051 for the earlier period and 0.37 for the later period). Of particular interest to us here are the effects of race. While the estimated effect of race is negative prior to the Rooney Rule and positive after the Rooney Rule, in both cases the effect of race is small and statistically insignificant. A chi-squared test cannot reject the null hypothesis that the coefficients on race are equal across the two periods at the 90 percent confidence level. Tests of equality of the estimated coefficients cannot reject the hypothesis that the coefficients for each of the other variables are unchanged across the two periods at the 95 percent confidence level, although we can reject the hypothesis that the coefficients on age and experience are unchanged at the 90 percent confidence level.

5 Conclusion

In this paper we have used data from the beginning of the 1970 season through the beginning of the 2009 season to examine the impact of race on the promotion of high-level assistant coaches to head coaching positions in the NFL. Using both logit regressions and hazard models, and controlling for age, experience and performance, we find no statistically significant race differences in the probability of being promoted from or leaving the set of high-level assistant coaches. Thus, there appears to be little support for the proposition that highly qualified African-American high-level assistant coaches are being overlooked when NFL teams hire a head coach. Nor is there much support for the proposition that the Rooney Rule has been successful at increasing the number of minority head coaches in the NFL, although the scarcity of minority head coaches makes it difficult to draw strong inferences.

These results do not imply that discrimination cannot be responsible for the dearth of minority NFL head coaches. Our analysis focuses on the ability of African-American candidates to be hired as NFL head coaches, conditional on their having already attained

the position of offensive or defensive coordinator. Minority representation in those positions is still relatively rare; in 2009, only 12 of the 67 high-level assistant coaches (18 percent) in our data were minorities. Discrimination could be responsible for the lack of minorities in the lower level coaching positions that represent the career path toward a head coaching job, although ironically it may also be the availability of a professional playing career as an alternative that reduces the number of African-Americans who go into coaching.

Our results suggest that the Rooney Rule, while perhaps a valuable public statement of league goals, is not a particularly effective method for increasing the number of minority head coaches. If the NFL desires to increase the number of minority head coaches, it might better direct its efforts to increasing the number of minorities entering the coaching profession and moving up through the coaching ranks. As Singell (1991) notes in the context of baseball, opportunities to move into coaching and succeed in coaching are affected by the sport-specific human capital that individuals obtain. By encouraging the acquisition of the human capital attributes necessary to succeed in coaching, and by encouraging minorities to think in advance about considering coaching when their collegiate playing careers end, the NFL could increase the number of minority assistant coaches generally, and ultimately the representation among head coaches.

References

- ALTONJI, J., AND R. BLANK (1999): “Race and gender in the labor market,” *Handbook of labor economics*, pp. 3143–3259.
- AURA, S., AND G. HESS (2010): “What’s in a name?,” *Economic Inquiry*, 48(1), 214–227.
- BERTRAND, M., AND S. MULLAINATHAN (2004): “Are Emily and Greg more employable than Lakisha and Jamal? A field experiment on labor market discrimination,” *American Economic Review*, 94(4), 991–1013.
- FAIRLIE, R. (2005): “An extension of the Blinder-Oaxaca decomposition technique to logit and probit models,” *Journal of Economic and Social Measurement*, 30(4), 305–316.
- FEE, C., C. HADLOCK, AND J. PIERCE (2006): “Promotions in the Internal and External Labor Market: Evidence from Professional Football Coaching Careers,” *The Journal of Business*, 79(2), 821–850.
- FRYER JR, R., AND S. LEVITT (2004): “The Causes and Consequences of Distinctively Black Names,” *Quarterly Journal of Economics*, 119(3), 767–805.
- GOFF, B., AND R. TOLLISON (2009): “Racial Integration of Coaching: Evidence From the NFL,” *Journal of Sports Economics*, 10(2), 127–140.
- GOLDIN, C., AND C. ROUSE (2000): “Orchestrating Impartiality: The Impact of “Blind” Auditions on Female Musicians,” *American Economic Review*, 90(4), 715–741.
- JANN, B. (2008): “The Blinder–Oaxaca decomposition for linear regression models,” *Stata Journal*, 8(4), 453–479.
- KAHN, L. (2000): “The Sports Business as a Labor Market Laboratory,” *The Journal of Economic Perspectives*, 14(3), 75–94.
- (2006): “Race, performance, pay, and retention among National Basketball Association head coaches,” *Journal of Sports Economics*, 7(2), 119–149.
- LAPCHICK, R. (2007): “2007 Racial and Gender Report Card,” Orlando, FL: University of Central Florida. The Institute for Diversity and Ethics in Sport.
- LAPCHICK, R. (2008): “The Buck Stops Here: Assessing Diversity among Campus and Conference Leaders for Division IA Schools in 2008-2009,” *The Institute for Diversity and Ethics in Sport (TIDES)*, University of Central Florida.

- MADDEN, J. (2004): “Differences in the success of NFL coaches by race, 1990-2002: Evidence of last hire, first fire,” *Journal of Sports Economics*, 5(1), 6–19.
- MADDEN, J., AND M. RUTHER (2010): “Has the NFL’s Rooney Rule Efforts “Leveled the Field” for African American Head Coach Candidates?,” *Journal of Sports Economics*, Forthcoming.
- MIXON, F., AND L. TREVINO (2004): “How race affects dismissals of college football coaches,” *Journal of Labor Research*, 25(4), 645–656.
- SCULLY, G. (1989): *The business of major league baseball*. University of Chicago Press, Chicago.
- SINGELL, L. (1991): “Baseball-specific human capital: Why good but not great players are more likely to coach in the Major Leagues,” *Southern Economic Journal*, 58(1), 77–86.
- YUN, M. (2005): “A simple solution to the identification problem in detailed wage decompositions,” *Economic Inquiry*, 43(4), 766–772.

TABLE 1: SUMMARY STATISTICS FOR HEAD COACH OBSERVATIONS

	F-H-P	S-S-W
SAMPLE PERIOD	1970–2001	1970–2009
TOTAL NUMBER OF FRANCHISES	31	32
NUMBER OF FRANCHISE YEARS	901	1157
NUMBER OF INDIVIDUALS	369	467
NUMBER OF PERSON-YEARS	2284	3077
HEAD COACH OBSERVATIONS	901	1157
MEAN AGE HEAD COACH	49.4	49.6
MEAN YRS. PRO EXPERIENCE FOR HEAD COACH	13.9	13.0
MEAN YRS. WITH TEAM FOR HEAD COACH	4.4	–
MEAN YRS. IN POSITION FOR HEAD COACH	3.4	4.02
MINORITY HEAD COACH OBSERVATIONS	–	80
MEAN AGE MINORITY HEAD COACH	–	47.9
MEAN YRS. PRO EXPERIENCE FOR HEAD COACH	–	12.3
MEAN YRS. EXPERIENCE AS HEAD COACH	–	4.7
MEAN YRS. IN POSITION FOR HEAD COACH	–	3.4

TABLE 2: SUMMARY STATISTICS FOR LEVEL-TWO COACH OBSERVATIONS

	F-H-P	S-S-W
OFFENSIVE COORDINATOR (OC) OBSERVATIONS	607	874
MEAN AGE OC	48.0	48.7
MEAN YRS. PRO EXPERIENCE FOR OC	11.8	9.0
MEAN YRS. WITH TEAM FOR OC	2.5	2.6
MEAN YRS. IN POSITION FOR OC	1.5	4.2
NUMBER OF TEAMS WITH AN OC IN 1970	7	7
NUMBER OF TEAMS WITH AN OC IN 1985	21	21
NUMBER OF TEAMS WITH AN OC IN 2001	30	32 in 2006
MINORITY OC OBSERVATIONS		56
MEAN AGE OC		50.0
MEAN YRS. PRO EXPERIENCE FOR OC		7.77
MEAN YRS. OF EXPERIENCE AS OC		3.76
MEAN YRS. IN POSITION FOR OC		1.98
	F-H-P	S-S-W
DEFENSIVE COORDINATOR (DC) OBSERVATIONS	776	1046
MEAN AGE DC	47.9	48.8
MEAN YRS. PRO EXPERIENCE FOR DC	12.6	9.6
MEAN YRS. WITH TEAM FOR DC	3.2	2.9
MEAN YRS. IN POSITION FOR DC	2.0	5.1
NUMBER OF TEAMS WITH A DC IN 1970	11	11
NUMBER OF TEAMS WITH A DC IN 1985	25	25
NUMBER OF TEAMS WITH A DC IN 2001	31	32 in 2006
MINORITY DC OBSERVATIONS		122
MEAN AGE MDC		46.7
MEAN YRS. PRO EXPERIENCE FOR DC		8.0
MEAN YRS. WITH TEAM FOR DC		2.32
MEAN YRS. EXPERIENCE AS DC		3.8

TABLE 3: LOGIT MODELS—MARGINAL EFFECTS[†]

	Model 1	Model 2	Model 3	Model 4	Model 5
Performance	0.037* (0.028)	0.031* (0.19)	0.026 (0.037)	0.007 (0.036)	0.035 (0.052)
Age	-0.005*** (0.001)	-0.004*** (0.001)	-0.006*** (0.002)	-0.004** (0.002)	-0.005*** (0.001)
Race	-0.001 (0.024)	-0.01 (0.016)	-0.015 (0.025)	0.031 (0.039)	-0.001 (0.019)
Year	-0.001 (0.001)	—	-0.002 (0.002)	0.004 (0.006)	-0.001 (0.001)
Experience	0.008*** (0.002)	0.006** (0.002)	0.008*** (0.003)	0.003 (0.003)	0.007*** (0.002)
OCDC	0.021 (0.014)	—	-0.004 (0.019)	0.012 (0.022)	0.022 (0.016)
-2*Log L	610.71	615.87	330.24	119.24	612.82
AIC	625.57	625.87	244.23	133.25	625.68
Obs.	1457	1457	577	339	1457

[†] The dependent variable takes a value of 1 if the level-two assistant is promoted to head coach and zero otherwise. The marginal effects are calculated at the point of means for all variables except performance, which is set at the 90th percentile. Asymptotic standard errors are presented in parenthesis. *, ** and *** denotes significance at the 10%, 5%, and 1% levels, respectively. Model 1 is estimated using all data from 1970 through 2009. Model 2 is estimated using all data from 1970 through 2009 with Year and OCDC omitted. Model 3 is estimated using data from 1990–2002. Model 4 is estimated using data from 2003–2009. Model 5 is estimated using a performance measure that corrects for correlation among performance measures.

TABLE 4: HAZARD MODELS—MARGINAL EFFECTS[‡]

	Model 1	Model 2	Model 3: Prom.	Model 3: Quit/ Fire
Performance	0.106 (0.164)	0.088 (0.136)	0.805 (0.998)	-24.34 (34.43)
Age	-0.012 (0.014)	-0.010 (0.011)	-0.081 (0.069)	2.673 (3.39)
Race	-0.020 (0.050)	-0.024 (0.043)	-0.125 (0.294)	0.956 (19.86)
Experience	0.043 (0.063)	0.034 (0.049)	0.564 (0.585)	57.315 (88.88)
OCDC	0.043 (0.068)	— —	338 (0.423)	18.802 (27.79)
-2*Log L	637.38	639.18	662.32	1448.12
AIC	647.38	647.17	672.32	1438.13
Subjects	252	252	252	237

[‡] The dependent variable is the duration of time spent as a level-two coach. The marginal effects are calculated at the point of means for all variables except performance, which is set at the 90th percentile. Asymptotic standard errors are presented in parenthesis. Model 1 is a hazard model with time spent as level-two coach as dependent variable. The model is estimated using all data from 1970 through 2009. Model 2 is a hazard model that is estimated using all data except OCDC observations. Model 3: Prom. and Model 3: Quit/Fire are the results from estimating a competing hazard model in which the level-two coach's tenure can end in a promotion or a quit/fire. We do not distinguish between quits and fires. The model is estimated using all data from 1970 through 2009.

TABLE 5: BLINDER-OAXACA DECOMPOSITION- 2003-2009[§]

Promotion	Coefficient	Robust Std. Error	Significance Level
Group 1	0.059	0.001	0.000
Group 2	0.045	0.016	0.006
Difference	0.015	0.017	0.406
Explained	0.014	0.006	0.020
Unexplained	0.001	0.018	0.967

[§] The Blinder-Oaxaca Decomposition result was generated using the Stata implementation of the Blinder-Oaxaca decomposition by Jann (2008), using methods derived by Yun (2005); see also, Fairlie (2005).