

# **Racial double standards? The case of expected performance and dismissals of head coaches in NBA**

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## **ABSTRACT**

Professional basketball in the US provides an opportunity to test racial differences in the labor market. In contrast to other professional sports, such as baseball or American football, and, more deeply, to other economic sectors, black Americans are represented in influencing positions as head coaches in this competitive setting. The paper investigates the influence of the race of the coach and performance (winning ratio and an efficiency index relative to expectations) on dismissal decisions. The data includes coach-team information over a 20-year period of time in the National Basketball Association (NBA) and the analysis uses several probit models. The results show that black head coaches are more likely to be fired and less prone to quit than white head coaches, *ceteris paribus*. Both measures of performance (efficiency and victories) also play a significant role in dismissals.

Keywords: Basketball, Coaches, Dismissal, Efficiency, Race, Performance, NBA

## **1. Introduction**

In the words of Samuel Johnson, racial discrimination was a fact "too evident for detection and too gross for aggravation" in the American society of the first part of the 20th century (Arrow, 1998, p. 92). African Americans had a strictly limited access to certain jobs, which prevented them from creating a social network and reaching top positions (Ibarra, 1995). In recent years, although African Americans still face barriers to access leadership jobs in certain sectors, they have successfully scale top positions in professional sports, particularly in basketball. However, the question that still arises is: Are black and white Americans treated differently in the labor market?

Many authors have dedicated their research in different sectors to answer this question by analyzing, e.g., rates of employment (Riach & Rich, 2002), wages (Charles & Guryan, 2008), or seniority (Altonji & Blank, 1999) of employees from minority groups. However, most of the contributions in economics do not examine racial differences in managerial positions due in part to the limited representation of racial groups. In this paper, we use data from professional basketball head coaches to analyze the influence of race on dismissal decisions. If racial preferences interfere in the assessment of the work of employees in influencing positions, both the social role of minorities (Arrow, 1988), and the wealth of firms and organizations (Becker, 1957) are at risk.

In order to analyze the dismissal decisions in professional basketball, this paper refers to the extensive body of literature that examines the determinants of team leaders' turnover in sports, e.g., Humphreys, Paul, and Weinbach (2016) and business firms, e.g., Farrell and Whidbee (2003). These studies analyze factors related to the age, education and experience of coaches, and the performance of teams and firms. In sports, recent studies introduce the dimension of expected results to investigate the performance of coaches and

its influence on dismissals, e.g., van Ours and van Tuijl (2016). In this line, this paper examines the difference between expectations and actual results of black and white head coaches in NBA and the probabilities of being fired.

The analysis of racial differences in competitive sports, especially basketball, is relevant due to three main reasons: (1) the presence of African Americans in leadership positions as coaches; (2) the visibility/availability of the results of the teams; (3) the large salaries and compensations at stake.<sup>1</sup> The efforts of Kahn (2006), and Fort, Lee, and Berri (2008), who introduce efficiency to detect racial discrimination practices in the retention of NBA coaches, are two noted precedents.

The contribution of this study to the discrimination literature, which is interested in the influence of race on dismissals in NBA, is twofold. On the one hand, the analysis incorporates the dimension of fans expectations to calculate the efficiency of coaches. And, on the other hand, the database is larger with respect to previous studies and covers the period 1993-94 through 2016-17.

The rest of the paper is organized as follows. Section 2 reviews the literature on performance and racial differences in sports. Section 3 describes the basketball data and the analyses. Section 4 shows the results, while section 5 includes some robustness checks. Section 6 discusses the most relevant findings and provides future research opportunities. Finally, Section 7 concludes the paper.

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<sup>1</sup> Hoopshype (2016) shows that the salaries of head coaches in NBA are far above the average salary in the US. Moreover, these coaches sign for several years. At the top of the list, we find Gregg Popovich (\$55 million, 5 years in San Antonio Spurs) or Doc Rivers (\$50 million, 5 years in LA Clippers).

## 2. Literature review and overview

Representatives of the international activist movement Black Lives Matter emphasizes that the residue of discrimination affects several areas such as education, health care, or the economy in the US (Deruy, 2016). Research results from field experiments point towards this direction. For instance, Edelman, Luca, and Svirsky (2017) shows that African Americans receive 16% less acceptance calls than White Americans in a short-term housing rental portal (Airbnb), *ceteris paribus*. Similarly, Pager, Bonikowski, and Western (2009) demonstrate that black applicants were half as likely as equally qualified whites to receive a callback from a job offer in the low-wage labor market of New York City.

Professional sports leagues offer the possibility to investigate the labor conditions of black Americans in the top positions of a very competitive labor setting. In US basketball, African Americans have scaled to the most influencing positions as coaches in professional (NBA) and college (NCAA) leagues. Still, it remains unclear whether African Americans suffer from double standards once they enter this labor market. The share of black coaches is relatively low in comparison to the number of players and assistant coaches. In NBA, Lapchick and Balasundaram (2017) report that the number of players of color was close to 80%, while the number of coaches only represented the 30% of the share. Additionally, this percentage is even lower when we analyze the list of head coaches who had won the NBA championship<sup>2</sup>. This paper uses measures of performance to assess the work of coaches and investigate potential unfair dismissals.

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<sup>2</sup> In particular, the first black American head coaches in this list are the former professional players, K.C. Jones and Bill Russell, who won 2 titles with the Boston Celtics (in the 1980s and the 1960s, respectively), in the 10<sup>th</sup> and 11<sup>th</sup> position. Then, Al Attles or Lenny Wilkens, who won the title with the Golden State Warriors and the Seattle Supersonics respectively, during the 1970s, in the 15<sup>th</sup> position. The recent isolated cases of Doc Rivers (2008 with the Boston Celtics) and Tyronn Lue (2016 with the Cleveland Cavaliers) complete the short list of black head coaches who have won the NBA championship.

The performance of firms is an important determinant of dismissal in many sectors (Brickley, 2003). However, in several cases measuring performance is not straightforward, and the variables are not able to capture the managerial influence of leaders (Kulik & Metz, 2015). This is especially problematic in organizations where teams are composed of a large number of members. In the literature of sports economics, it is easy to obtain accurate measures of team performance such as the winning percentage, which has been widely used in previous research<sup>3</sup>, e.g., Idson and Kahane (2000); Dietl, Lang, and Werner (2009).

Moreover, in sports competitions, we consider the perceived status, objectives and expectations of teams. The same winning percentage of two different teams can have different implications for performance, if they do not have similar objectives and resources. This study includes a measure of efficiency of the team to account for this differences. Specifically, we use the information from the odds to identify expectations and calculate an efficiency index of coaches with the aim of investigating unfair race-based labor assessment.

Previous studies have also used information from betting odds to analyze the actual results of teams in comparison to expectations. In college football, Humphreys et al. (2016) use the cumulative winning percentage (actual result) with respect to point spreads from the betting market (expected result) to assess the performance of coaches and the probabilities of turnover. With a similar purpose, in European soccer leagues, van Ours and van Tuijl (2016) analyze the cumulative surprise (actual vs. expected points) of a team in a season.

In this paper, we use a similar approach to calculate the efficiency of coaches following

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<sup>3</sup> Other commonly used measures in the literature of determinants of coach dismissal include the position in the ranking (Bachan, Reilly, & Witt, 2008), the changes in the position (d'Addona & Kind, 2014), results in recent matches (Audas, Dobson, & Goddard, 1999), points (Frick, Barros, & Prinz, 2010), and managerial efficiency (Tena & Forrest, 2007).

the methodology proposed by del Corral, Maroto and Gallardo (2015), in which the efficiency is calculated as the inverse of the probability from betting odds of obtaining more victories than the actual ones.

Other recent studies in different professional sports leagues also include the difference between expected (betting odds) and actual (game outcome) results to analyze the probabilities of firing the coach: e.g., in NBA Silver (2014); in professional soccer leagues Pieper, Nüesch, & Franck (2014) in Germany; Elaad, Jelnov, and Kantor (2018) in England; or Bryson, Buraimo and Simmons (2017) in Italy, Germany, and Spain. The results demonstrate that previous expectations play an important role in the dismissal of coaches.

This literature that focus on the previous expectations of performance to analyze the dismissal of coaches rely on the information from the betting market. Although some studies identify biases in the market such as bettor sentiment (Levitt, 2004), or specific teams' prior benefits (Paul & Weinbach, 2009), many empirical works have confirmed the possibility to use odds to accurately predict game outcomes since the paper of Sauer (1998). The nature of the relationship between bookmakers and bettors makes this market efficient. While the former need to use all the information available to set accurate odds that prevent bettors from finding loops, the latest place their bets on games with the aim of earning a profit.

Therefore, this market avoids unreal estimations of the game outcomes on both sides of the table, which allows research to obtain the embedded probabilities of winning. Thus, measures of performance based on betting information are commonly used to understand the determinants of sports demand in recent contributions (Coates, Humphreys, & Zhou, 2014; Pawlowski, 2013), as they stand closer to the perspective of fans. In this study, we

use the information from the odds to calculate the efficiency of coaches (expected victories vs. actual victories) and its influence on dismissals in NBA.

The results of this study will extend the former contributions of Fort et al. (2008) and Kahn (2006) on the analysis of the determinants of dismissal and retention by race in the NBA. Fort et al. (2008) uses stochastic frontier models to calculate the technical efficiency of coaches, where the inputs are the contributions (statistics) of players for each team in specific positions (i.e., guard, small forward and big men). The authors find no evidence that suggests that racial preferences determine the dismissal of NBA coaches during the period 2001-2004. Similar to these results, Kahn (2006) finds an insignificant effect of race on the probability of being fired, using hazard models with information on the teams' winning percentage and the characteristics of coaches from 1996 to 2004.

The expected results of this study are similar to the above-mentioned as race *per se* should not interfere in turnover decisions in NBA. The high-competitive nature of the teams in this league and the visibility of their performance should diminish the prevalence of racial preferences.

### **3. Data description and methods**

In this paper, we use data on NBA teams and coaches that cover the period 1993-94 through 2016-17 and come from different sources. On the one hand, the information on the actual and expected results of teams are extracted from: [www.nba.com](http://www.nba.com), [www.covers.com](http://www.covers.com) and [www.oddsportal.com](http://www.oddsportal.com), respectively. On the other hand, the characteristics of coaches and their contractual relationship with teams were gathered using the official websites of teams, [www.nba.com](http://www.nba.com) and [www.basketball-reference.com](http://www.basketball-reference.com).

Similar to Bryson et al. (2017), this analysis distinguishes between coaches that decided to voluntarily leave the team and coaches that were fired. We collected the appropriate information from the official websites of teams, [www.basketball-reference.com](http://www.basketball-reference.com) and the sport section of several newspapers. In this competitive setting, we find fewer in-season dismissals than in other leagues/sports e.g., soccer leagues in Germany (Frick et al., 2010), or Argentina (Flores, Forrest, & Tena, 2012). Specifically, the data shows that the average of teams without coach replacements within a season is over 86%. Other important fact about the NBA head coaching market is that very few head coaches sign for a better team (in terms of winning record) or a better contract (in another team), before terminating the contract in the current team (<3%).<sup>4</sup>

The racial gap between players and head coaches in NBA reported by Lapchick and Balasundaram (2017) finds support in our data. Figure 1 shows the number of games coached by black and white head coaches during the analyzed period. This evolution reveals that, although the number of games coached by black head coaches has increased over time, their representation is consistently lower. Peaks and valleys in the number of games coached by African Americans is the trend for the last 15 seasons.

[Insert Figure 1 near here]

Beyond the racial composition of the teams' coaching positions, this study also provides insights about the background and previous experience of head coaches working in this competitive setting. For example, we investigate if head coaches are former players of this competition, and differences by race. Contingency tables are used to analyze the relationship between the race of the coach and previous experience.

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<sup>4</sup> The low number of contract improvements in the sample preclude us from further analyzing the determinants of these changes.



Some papers have focused on the efficiency of coaches, as a determinant of dismissal, and race to detect unfair practices in NBA (Fort et al., 2008; Kahn, 2006). In this setting, we use the relationship between expected and actual results to calculate the efficiency of head coaches, as in del Corral et al. (2015). From basic probability theory, we know that the probability of two independent events equals the product of these probabilities. In a basketball game, we know the probability of a team winning 2 consecutive games by multiplying the probabilities of these two events. By doing so with the probabilities of all possible game outcomes for a team in a season (from betting odds), we calculate the density function of victories.

Thus, the inverse of the sum of the probabilities of achieving more victories than the actual ones provides a measure of coaching efficiency. The most efficient coaches will obtain values close to 1, while inefficient coaches will tend to numbers close to 0.<sup>5</sup> This measure is relevant to our analysis because of two main reasons. First, we incorporate the expectations of fans to calculate the efficiency of coaches. Second, we analyze racial differences and control for actual and relative performance of coaches.

A first analysis to investigate the relationship between the efficiency of coaches and dismissals consist of a contingency table. Thus, we are able to examine the number of dismissals at different intervals of efficiency. According to previous results in the literature, we expect to observe a higher number of dismissals when the efficiency of coaches is low. Moreover, we also include the race of the coach in the analysis of efficiency and the probability of being fired in order to detect a racial bias.

Finally, we estimate several probit models to investigate the influence of efficiency, performance and race on the contractual relationship between NBA teams and head

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<sup>5</sup> For a further explanation on the calculations of efficiencies, please see del Corral et al. (2017).

coaches, using data from the seasons 1993-94 to 2016-17. In the model estimation, we use 809 coach observations<sup>6</sup>. Thus, the data set is larger and extends the previous efforts of Fort et al. (2008) and Kahn (2006). The dependent variables of our probit models are: (1) dismissals, (2) dismissals that exclude the interim coaches<sup>7</sup> who were fired from the sample, (3) resignations, and (4) all kind of coach's exits.

The analysis includes the following independent variables: *black* is a dummy variable that takes value one if the coach is African American and zero otherwise.<sup>8</sup> Then, following the idea of van Ours and van Tuijl (2016), we include our measure of *efficiency* of the coach as a determinant of dismissal. The values of efficiency are between zero (highly inefficient) and one (highly efficient). As a traditional measure of actual performance, we include the *victory rate* (0-1)<sup>9</sup>, the *age* (and *squared age*) of the coach, dummies that account for coaches' *bad previous seasons* -takes value 1 if the coach had an efficiency below 0.5 in the same team in the previous season-, *NBA winners*, or *former NBA players*, and the *coaching experience*, which is the number of years at their current position. Table 1 contains the descriptive statistics for the variables used in the analysis of dismissals of NBA head coaches.

[Insert Table 1 near here]

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<sup>6</sup> The observation is defined as the coach within a team in a particular season. Therefore, if a coach worked for two different teams in the same season, the analysis would include two different observations.

<sup>7</sup> Interim coaches are those coaches already enrolled within a NBA team. These coaches are upgraded to head coach, but the team has no intention to maintain them in this position in the long term. In our sample, we find 33 interim coaches, who average less than 24 matches per observation.

<sup>8</sup> The complete list of coaches in our database and the attributed race can be found in the appendix. The race was attributed by the authors by looking at pictures of the face of the coaches. Some of them were considered mulattos. However, the number of mulattos was too small in order to make any statistical analysis. Hence, the analysis only distinguishes between black Americans and white Americans.

<sup>9</sup> In our sample, the correlation between the victory rate and efficiency is positive as expected, i.e., 0.622. Although the correlation is positive, it is not so high. Therefore, in order to fully consider the performance of teams, the analysis includes both measures.

In detail, our database is composed of 809 observations. This sample includes 211 dismissals, from which 120 belong to white coaches and 90 to black coaches (see Table 2). The ratio firings and observations is larger for black coaches than it is for white coaches. Moreover, there are 44 quits, and only 8 of them involve black coaches. Finally, the data has 33 interim coaches (18 white and 15 black).

[Insert Table 2 near here]

#### **4. Results**

The contingency tables that firstly explore the relationship between the race of the coach and their professional background provide interesting results. Table 3 shows that in our sample, while the majority of black head coaches previously played professional basketball, the 60% of white head coaches took other carrier paths. The result, which is significant at the 1% level, is relevant for students or athletes that want to pursue a career in professional basketball coaching. African Americans seem to be required to prove themselves as players prior to becoming head coaches in NBA.

[Insert Table 3 near here]

This study also analyzes the relationship between dismissals and the efficiency of coaches. Table 4 shows the number of dismissals at different intervals of efficiency. As expected, we find that the higher the efficiency of NBA head coaches, the lower the number of dismissals, and vice versa.

[Insert Table 4 near here]

In order to test the differences in dismissals by race, first, we use a contingency table. Thus, Table 5 shows that the percentage of black coaches that are fired is always higher than this of white coaches at all intervals of efficiency. We find the most shocking

difference in the interval that goes from 0.3 to 0.4. The percentage of black coaches that were fired at this interval of efficiency in NBA (60%) doubles the percentage of dismissals of white coaches (30%). These results suggest the possible existence of double standards when it comes to assess the performance of black and white head coaches in NBA. To further test this hypothesis, we follow previous analyses in the literature and estimate probit models of the determinants of sports head coach dismissals.

[Insert Table 5 near here]

Table 6 contains the results of four probit models results. While the first model analyzes the dismissals of all coaches, the second one excludes the interims. The third one examines the quits, and the fourth includes all kind of exits. The results show that the better the performance the less likely the exit. The coefficient of the two present performance variables, i.e., efficiency and victory rate, are negative and significant in the models of dismissals (1 and 2) and all exits (4). These results suggest that teams consider both the efficiency and the victories when judging the performance of coaches. The case of Sam Vincent is illustrative. This coach was fired from the Charlotte Hornets after the season 2007-2008, in which the team obtained 32 victories out of 82 games. Thus, although the team had an efficiency score of 0.76, the team managers decided to fire Sam Vincent.

With respect to the coefficient of the main variable (black dummy), the analysis shows two interesting results. First, the variable is positive and significant in the models of dismissals (1 and 2), which indicates discriminatory practices in the firing process. Second, the black dummy is negative and significant in the model of quits (3), which demonstrates that black head coaches in NBA are less likely to quit than their white counterparts (at a 1% level).

[Insert Table 6 and Figure 2]

Figure 2 displays the evolution of the marginal effect of the black dummy at different values of the two performance variables. The results show that the marginal effect is positive, but it decreases with higher values of the efficiency and the winning ratio. Therefore, the probability of firing a black coach or a white coach is closer when the performance of teams increases.

## **5. Robustness checks**

As some of the variables included in the previous probit models can be related to some extent with the black dummy variable, e.g., *age*, *NBA winner*, *coaching experience*, or *NBA player*, it is important to check the robustness of the results. Hence, Table 7 provides probit estimates for the four dependent variables previously analyzed, i.e., dismissals, dismissal with no interims, quits and all exits, with two different sets of independent variables. First, the models only include the black dummy as covariate. Then, the models incorporate the rest of the variables related to performance (efficiency, victory rate and the bad previous season dummy).

[Insert Table 7]

The results of these robustness checks are similar to the ones from Table 6. The performance variables have the same coefficient signs the levels or significance are almost the same. And more importantly for our research question, the coefficients of the black dummy also have the same signs, and similar significance levels.

## **6. Discussion**

Professional sports leagues are often used as a laboratory to test general topics of interest in behavioral economics (Kahn, 2000). Namely, this paper investigates the influence of

the race on the dismissals of NBA head coaches over 24 years. Moreover, this analysis follows recent contributions that analyze performance of sports coaches and turnover (Humphreys et al., 2016; van Ours and van Tuijl, 2016), and calculates an efficiency index of coaches using expectations from betting data. Thus, the results provide the literature on racial biases in competitive settings with a new dimension to examine the performance and efficiency of team leaders.

The main findings of this paper demonstrate the role of race in dismissal decisions. The probit results confirm that there is a significant relationship between the race of the coach and the probability of being fired. Specifically, a black head coach is 8.1% more likely (6.4% if excluding the interim coaches) to be fired than a white coach after controlling for several factors such as performance. A similar result is found in Mixon and Treviño (2004), where black college football coaches have 9.6% more probabilities of being fired than white coaches (*ceteris paribus*). However, the results from our study contrast previous findings in the literature that analyze efficiency and racial differences in this competitive setting. Neither Fort et al. (2008) nor Kahn (2006) find significant differences in the probability of being fired between black and white head coaches in the NBA.

This paper mainly differs from the above-mentioned studies in the use of a larger data set and the approach to measure performance. This analysis includes two complementary measures, i.e., victory rate and an efficiency index derived from betting odds, in line with Bryson et al. (2017). While Fort et al. (2008) use players' statistics as inputs in a stochastic frontier model to calculate the efficiency of coaches, Kahn (2006) considers actual game results and controls by team payroll to calculate efficiency and build hazard models. In our study, both performance measures are significant. Therefore, future papers that aim to analyze dismissals of coaches in sports teams should consider including not only

measures of team performance such as victory rates or average points per game, but also indexes of efficiency.

This paper uses the probabilities of obtaining victories from betting odds to calculate the efficiency of coaches and examine racial differences, which we consider informative in several ways. First, a weak form of efficiency characterizes this betting market, in which bookmakers are motivated to prevent losses and bettors want to make a profit. Moreover, the agents use all public information available, what ensures the access to accurate expectations on team performance (Sauer, 1998). Second, the owners of teams use wins to create value to fans (Fort et al. 2008), so using expected outcomes from betting odds, which are close to the perceptions of the public opinion (Bowman, Ashman, & Lambrinos, 2013), can help to assess the performance of coaches.

Finally, given the similarities between the remit of CEOs in corporations and head coaches in professional team sports, the use of a market-based measure of expected results is useful for the literature interested in team leaders' turnover. Humphreys et al. (2016) argue that these measures have the potential to assess the performance of leaders and avoid some of the biases that exist in the corporate setting, e.g., CEOs that use the media to manage and influence the analysts' expectations and forecasts (Farrell & Whidbee, 2003). Moreover, the limited representation of black Americans in the highest ranks of top companies in other sectors<sup>10</sup> makes professional sports leagues an important setting to examine racial disparities in the labor market.

In this sense, we would not expect that the race significantly affects the contractual relationship between employees in influencing positions and clubs/corporations, mainly because of two reasons. On the one hand, the dismissals of team leaders' in any

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<sup>10</sup> For instance, the percentage of black CEOs in Fortune 500 companies is below 1% (White, 2017).

organization is a risky decision because, first, they do not ensure an improvement in performance as the new coach needs to adjust to the team (Frick et al. 2010); and second, they often have an implicit direct cost in form of large compensation payments (Tena & Forrest, 2007). On the other hand, following the idea of Szymanski (2000), high-competitive settings such as professional basketball, in which the performance of coaches and characteristics of players are highly visible, should lessen the influence of racial preferences. Still, we find that black Americans head coaches are more likely to be fired and less prone to quit than white Americans in similar positions.

Historical discrimination and negative stereotypes towards blacks are difficult to dismiss in any society after such a short period of time. Thus, previous contributions to the literature on this specific competitive setting that analyze the implications of the racial composition of NBA teams can help to explain this unexpected result. Kanazawa and Funk (2001) found evidence that fans tend to watch more local non-cable NBA games when the number of white players in the team rosters is higher. Similarly, Burdekin, Hossfeld, and Smith (2005) discovered that a match between the racial composition of teams and this of the market area increases home attendance, which led to the most skilled white players to areas with a larger white population during the 90s. These racial preferences might have been embedded in the American society and encourage some NBA team owners to fire black Americans head coaches when their efficiency is on the edge.

Beyond the significant influence of race on NBA head coaches' dismissals, the probit results demonstrate that the performance of teams and the efficiency relative to expectations of coaches are the most important determinants of dismissal in this sport setting. These papers show a significant influence of the victory rate of head coaches on



the probability of being fired. This is line with previous empirical findings in several contexts. Independently of the measures of performance, there is consensus in the literature since early contributions in different US corporate settings, e.g., Brickley (2003), or professional sports leagues, e.g., Audas, Dobson, and Goddard (1997).

Finally, the results support recent findings that confirm the significant influence of the performance of the team leaders relative to team expectations (also called “surprise” measures) on dismissals in college football (Holmes, 2011; Humphreys et al., 2016), European soccer leagues (Bryson et al., 2017; van Ours and van Tuijl, 2016), or US firms (Engel, Hayes, & Wang, 2003). This study provides new evidence with a market-based measure (expected number of victories) to calculate the efficiency of coaches, which plays a significant role on turnover decisions in NBA. Future studies can explore other alternatives to account for performance relative to expectations.

The use of odds from the betting market to create the index of efficiency is a limitation of the study, as other sports leagues with lower interest and media impact do not provide this information. Similar limitations are found in the studies on the corporate that use the forecasts of firm performance to include expectations (Farrell & Whidbee, 2003). Although the implications of discriminating in highly competitive and visible settings are more relevant from the economic perspective (larger salaries and compensations), minor sports leagues and small enterprises can report different insights on racial discrimination.

In line with this study, future research on performance and turnover in managerial positions by race can include other moderators such as the racial composition of teams, and especially the race of the star players, or geographical differences. Studies that analyze sports leagues with play-offs can further explore the influence of the results at this stage on dismissal decisions. For example, NBA is divided into two stages: regular-

season and play-offs. Nonetheless, the performance of teams in the play-offs are not considered in our analysis. It is difficult to find objective variables that show the performance of teams in the play-offs due to the limited number of games. This setting increases the levels of uncertainty and multiply the importance of external factors such as injuries or sanctions that can influence the outcome. Thus, previous literature has omitted this analysis, and there is the notion that play-offs are not for science but for fan (Berri, 2013).

Still, subsequent papers can incorporate measures that account for racial differences in performance under pressure (play-offs). NBA playoffs are a best-of-seven elimination series, in which teams play home and away games with the pressure that generates the possibility of being eliminated from the competition. These results can provide insights about leadership characteristics and behaviors of black and white managers in these situations, which is not possible in other settings due to the limited number of black leaders.

## **7. Conclusions**

The main aim of the paper is to analyze whether black head coaches have to cope with discriminatory practices in a highly competitive labor setting such as the NBA, in which, moreover, the majority of players are black Americans. The analysis includes information from the seasons 1993-94 to 2016-17. A first difference in the labor conditions by race relates to the fact that the majority of black head coaches have a professional playing career in the NBA, while white head coaches do not.

To build on this finding and further examine the differences by race, several probit models were estimated. The results show that black head coaches are more likely to be fired than white head coaches, *ceteris paribus*. The analysis includes two measures of performance

1. an efficiency index based on expectation from betting odds; 2. victory rate, that shows the expected results. The better the performance of teams, the lower the probabilities of coaches of being fired. Other variables control for the influence of coach characteristics. The most interesting finding is that coaches that were successful before (NBA winners) are less likely to be dismissed and more prone to quit.

These findings contribute to extend the knowledge of team efficiency and racial differences in dismissals that first generated the works of Kahn (2006), and Fort et al. (2008). Moreover, this study incorporates the dimension of performance relative to expectations, which has been used in recent contributions on labor decisions and managerial positions (Humphreys et al., 2016; van Ours and van Tuijl, 2016).

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**Table 1.** Descriptive statistics

<b>Variable</b>	<b>Obs.</b>	<b>Mean</b>	<b>Std. Dev.</b>	<b>Min</b>	<b>Max</b>
Black (dummy)	809	0.33	0.47	0	1
Efficiency	809	0.53	0.29	0	1
Victory rate	809	0.48	0.17	0	1
Bad previous season (dummy)	809	0.21	0.41	0	1
Age	809	50.08	7.92	32	71
Coach NBA winner (dummy)	809	0.13	0.34	0	1
Former NBA player (dummy)	809	0.61	0.49	0	1
Tenure	809	2.90	2.72	1	21

**Table 2.** Contingency table of fired, quit and interims by race

	Fired		Quit		Interims	
	No	Yes	No	Yes	No	Yes
White	426	120	510	36	528	18
Black	172	91	255	8	245	15

**Table 3.** Contingency table between former NBA players and head coaches by race

<b>NBA player</b>	<b>White coach</b>	<b>Black coach</b>	<b>Total</b>
No	62 (60%)	13 (20%)	75 (45%)
Yes	41 (40%)	51 (80%)	92 (55%)
Total	103 (100%)	64 (100%)	167 (100%)

Pearson  $\chi^2 = 25.376$ ; p-value= 0.000; Cramer's V = 0.389

**Table 4.** Contingency table between coach efficiency and dismissal

Efficiency	Dismissal		Total
	No	Yes	
[0-0.1)	34 (45%)	42 (55%)	76 (100%)
[0.1-0.2)	42 (56%)	33 (44%)	75 (100%)
[0.2-0.3)	44 (67%)	22 (33%)	66 (100%)
[0.3-0.4)	41 (61%)	26 (39%)	67 (100%)
[0.4-0.5)	54 (68%)	25 (32%)	79 (100%)
[0.5-0.6)	67 (82%)	15 (18%)	82 (100%)
[0.6-0.7)	77 (80%)	19 (20%)	96 (100%)
[0.7-0.8)	61 (81%)	14 (19%)	75 (100%)
[0.8-0.9)	94 (90%)	10 (10%)	104 (100%)
[0.9-1]	84 (94%)	5 (6%)	89 (100%)
Total	598 (100%)	211 (100%)	809 (100%)

Pearson  $\chi^2 = 95.403$ ; p-value = 0.000; Cramer's V = 0.343

**Table 5.** Relationship between dismissals and efficiency by race

Efficiency	White coaches		Black coaches	
	% of fired coaches	N	% of fired coaches	N
[0-0.1)	51	47	62	29
[0.1-0.2)	43	42	45	33
[0.2-0.3)	30	46	40	20
[0.3-0.4)	30	47	60	20
[0.4-0.5)	26	46	39	33
[0.5-0.6)	13	60	32	22
[0.6-0.7)	19	69	22	27
[0.7-0.8)	15	54	29	21
[0.8-0.9)	8	71	12	33
[0.9-1]	5	64	8	25
Total	-	546	-	263

**Table 6.** Probit regression results

Variables	(1) Dismissal		(2) Dismissal <sup>+</sup>		(3) Quit		(4) All exits	
	Coef.	ME	Coef.	ME	Coef.	ME	Coef.	ME
Black (dummy)	0.306*** (2.599)	0.081	0.250** (2.036)	0.064	-0.420** (-2.055)	-0.042	0.179 (1.575)	0.054
Efficiency (0-1)	-1.126*** (-4.806)	-0.299	-1.112*** (-4.632)	-0.284	-0.507 (-1.439)	-0.050	-1.165*** (-5.267)	-0.350
Victory rate (0-1)	-1.674*** (-3.945)	-0.445	-1.783*** (-3.885)	-0.455	-0.512 (-0.813)	-0.051	-1.826*** (-4.5)	-0.549
Bad previous season (dummy)	0.077 (0.588)	0.020	0.126 (0.957)	0.032	0.344* (1.941)	0.034	0.203* (1.651)	0.061
Age	0.031 (0.43)	0.008	0.076 (0.965)	0.019	-0.268*** (-2.843)	-0.027	-0.073 (-1.076)	-0.022
Squared age	0 (-0.289)	0.000	-0.001 (-0.906)	-0.000	0.003*** (3.048)	0.000	0.001 (1.313)	0.000
NBA winner (dummy)	-1.156*** (-4.348)	-0.307	-1.069*** (-4.09)	-0.273	0.436** (2.058)	0.043	-0.415** (-2.309)	-0.125
Coaching experience	0.029 (1.12)	0.008	0.049* (1.89)	0.012	0.005 (0.188)	0.000	0.025 (1.185)	0.008
NBA player (dummy)	-0.118 (-1.042)	-0.031	-0.077 (-0.657)	-0.020	0.168 (0.99)	0.017	-0.052 (-0.48)	-0.016
Constant	-0.417 (-0.228)		-1.483 (-0.746)		5.030** (2.073)		2.285 (1.322)	
Pseudo-R <sup>2</sup>	0.174		0.165		0.110		0.157	
Log-L	-383.378		-354.849		-152.076		-429.361	
N. of observations	809		776		809		809	
Number of 1 in dependent variable	211		184		44		262	

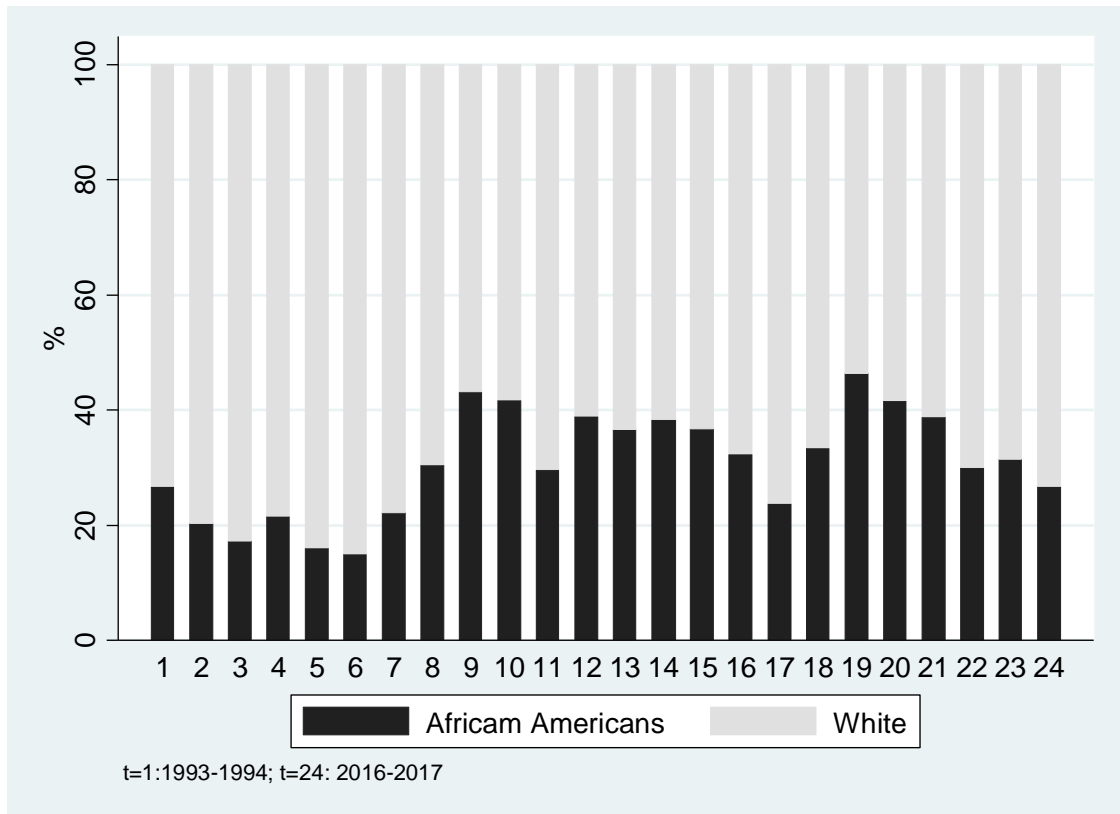
Note: In (2) Dismissal<sup>+</sup> interim coaches are not considered. In parenthesis it is shown the t-student value. ME are the average marginal effects. \*p<0.10, \*\*p<0.05, \*\*\*p<0.01

**Table 7.** Robustness checks probit regression results

Variables	(1) Dismissal		(2) Dismissal <sup>+</sup>		(3) Quit		(4) All exits	
	Coef.	Coef.	Coef.	Coef.	Coef.	Coef.	Coef.	Coef.
Black (dummy)	0.377*** (3.785)	0.247** (2.319)	0.338*** (3.254)	0.209* (1.880)	-0.368** (-2.105)	-0.416** (-2.285)	0.260*** (2.683)	0.111 (1.069)
Efficiency (0-1)		-1.006*** (-4.496)		-1.033*** (-4.490)		-0.610* (-1.849)		-1.128*** (-5.259)
Victory rate (0-1)		-1.913*** (-4.966)		-1.886*** (-4.544)		-0.045 (-0.081)		-1.855*** (-4.992)
Bad previous season (dummy)		0.092 (0.737)		0.167 (1.322)		0.369** (2.230)		0.216* (1.811)
Constant	-0.773*** (-12.907)	0.604*** (3.815)	-0.832*** (-13.424)	0.545*** (3.116)	-1.507*** (-18.189)	-1.269*** (-5.562)	-0.545*** (-9.616)	0.876*** (5.547)
Pseudo-R <sup>2</sup>	0.015	0.145	0.012	0.136	0.014	0.045	0.007	0.145
Log-L	-457.159	-396.969	-419.775	-367.220	-168.493	-163.220	-505.872	-435.536
N. of observations	809	809	776	776	809	809	809	809
Number of 1 in dependent variable	211	211	184	184	44	44	262	262

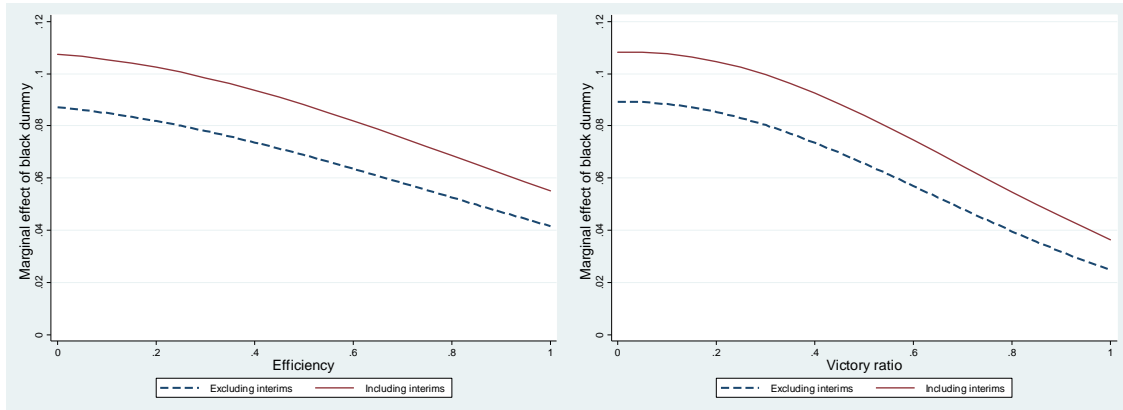
Note: In (2) Dismissal<sup>+</sup> interim coaches are not considered. In parenthesis it is shown the t-student value. \*p<0.10, \*\*p<0.05, \*\*\*p<0.01

**Figure 1.** Evolution of the percentage of games coached by race





**Figure 2.** Marginal effect of the probability of dismissal for black head coaches



Note: The marginal effects associated to the black dummy have been calculated with the Stata command *margins* asking for the average marginal effects for each increase of 0.05 in the *efficiency* and *victory rate* variables.

## APPENDIX

**Table A1.** Coaches, race and matches

<b>Coach</b>	<b>Race</b>	<b>Matches</b>	<b>Coach</b>	<b>Race</b>	<b>Matches</b>	<b>Coach</b>	<b>Race</b>	<b>Matches</b>
Rick Adelman	White	1,428	Jeff Bzdelik	White	192	Mike Dunlap	White	82
Richie Adubato	White	33	John Calipari	White	184	Mike Dunleavy	White	1,083
Danny Ainge	White	226	Kaleb Canales	White	23	Mike Evans	Black	56
Kenny Atkinson	White	82	PJ Carlesimo	White	554	Derek Fisher	Black	136
Randy Ayers	Black	52	Rick Carlisle	White	1,214	Bill Fitch	White	328
Tony Barone	White	52	Michael L. Carr	Black	164	Cotton Fitzsimmons	White	57
Tom Barrise	White	2	John Carroll	White	36	David Fizdale	Black	82
Butch Beard	Black	164	Butch Carter	Black	165	Tim Floyd	White	321
Bill Berry	Black	2	Fred Carter	Black	82	Chris Ford	White	453
Bill Bertka	White	2	Bill Cartwright	Black	151	Lawrence Frank	White	614
Bernie Bickerstaff	Black	527	Don Casey	White	112	Mike Fratello	White	638
JB Bickerstaff	Black	71	Dwane Casey	Black	598	Alvin Gentry	Black	869
Larry Bird	White	214	Don Chaney	Black	348	Frank Hamblen	White	39
Bill Blair	White	102	Maurice Cheeks	Black	620	Leonard Hamilton	Black	82
David Blatt	White	123	Jim Cleamons	Black	98	Bill Hanzlik	White	82
James Borrego	White	30	Steve Clifford	White	328	Del Harris	White	340
Jeff Bower	White	73	Doug Collins	White	603	Gar Heard	Black	44
Jim Boylan	White	106	Michael Cooper	Black	14	Bob Hill	White	316
Allan Bristow	White	246	Tyrone Corbin	Black	286	Brian Hill	White	613
Scott Brooks	White	627	Dave Cowens	White	284	Fred Hoiberg	White	164
Jim Brovelli	White	18	Michael Curry	Black	82	Lionel Hollins	Black	534
Brett Brown	White	328	Chuck Daly	White	214	Jeff Hornacek	White	295
Hubie Brown	White	168	Mike D'Antoni	White	963	Kim Hughes	White	33
Larry Brown	White	1,226	Johnny Davis	Black	219	Melvin Hunt	Black	23
Mike Brown	Black	563	Vinny del Negro	White	394	Lindsey Hunter	Black	41
Tony Brown	Black	45	Tony Dileo	White	59	Marc Iavaroni	White	123
Quinn Buckner	Black	82	Billy Donovan	White	164	George Irvine	White	106

M. Budenholzer	White	328	Larry Drew	Black	312	Dan Issel	White	306
Mark Jackson	Black	230	Mike Montgomery	White	164	Ed Tapscott	Black	71
Phil Jackson	White	1,312	Dick Motta	White	233	Reggie Theus	White	106
Stu Jackson	Black	39	Eric Musselman	White	246	Tom Thibodeau	White	476
Chris Jent	White	18	Pete Myers	Black	3	Isiah Thomas	Black	410
David Joerger	White	328	Kenny Natt	Black	58	Jim Todd	White	37
Avery Johnson	Black	440	Don Nelson	White	1,104	Rudy Tomjanovich	White	831
Dennis Johnson	Black	24	Jim O'brien	White	630	Jay Triano	White	229
Frank Johnson	Black	134	Kevin O'neill	White	82	Wes Unseld	Black	82
Magic Johnson	Black	16	Randy Pfund	White	64	Jeff van Gundy	White	748
Eddie Jordan	Black	600	Rick Pitino	White	248	Stan van Gundy	White	825
George Karl	White	1,580	Greg Popovich	White	1,656	Kiki Vandeweghe	White	64
Steve Kerr	White	246	Terry Porter	Black	215	Jacque Vaughn	Black	216
Jason Kidd	Black	328	Kevin Pritchard	White	27	Sam Vincent	Black	82
Lon Kruger	White	191	Kurt Rambis	White	230	Frank Vogel	White	513
Larry Krystkowiak	White	100	Pat Riley	White	1,013	Darrell Walker	Black	169
John Kuester	White	164	Doc Rivers	Black	1,388	Luke Walton	White	82
Bob Lanier	Black	37	Flip Saunders	White	1,246	Earl Watson	Black	115
Gene Littles	Black	16	Byron Scott	Black	1,101	Bob Weiss	White	112
Kevin Loughery	White	128	Brian Shaw	Black	141	Paul Westphal	White	515
Sidney Lowe	Black	254	Paul Silas	Black	629	Lenny Wilkens	Black	869
John Loyer	White	32	Scott Skiles	White	958	Herb Williams	Black	44
John Lucas	Black	370	Jerry Sloan	White	1,416	Monty Williams	Black	394
Tyronn Lue	Black	123	Keith Smart	Black	263	Brian Winters	White	184
Jim Lynam	White	210	Quin Snyder	White	246	Randy Wittman	White	684
Nate Macmillan	Black	1,012	Erik Spoelstra	White	722	Mike Woodson	Black	680
Brendan Malone	White	100	Garry St Jean	White	368			
Michael Malone	White	270	Bob Staak	White	1			
Kevin Mchale	White	417	Brad Stevens	White	328			
Sam Mitchell	Black	427	Terry Stotts	White	693			