**Is there A Positive Association between Increasing Salary Discrimination in the NBA
and Unshrinking Racial Income Gap of White and Black Citizens ?**

by

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Is there A Positive Association between Increasing Salary Discrimination in the NBA and Unshrinking Racial Income Gap of White and Black Citizens ?

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Abstract

From the late 2000s, racial salary discrimination against black players emerged in the National Basketball Association (NBA) league. At the same time in the United States, the income gap between white and black citizens, which had been decreasing in the previous 20 years, stalled in the mid-2000s and started to increase again from the late 2000s. In this study, we examine whether increasing racial salary discrimination against black players in the NBA is positively associated with the non-shrinking income gap between white and black citizens. Using census data, we calculate the median income ratio of white and black males in each metropolitan area where at least one NBA team is located. Then, we examine whether the white premium of the salary of an NBA player is correlated with the median income ratio between white and black citizens of the metropolitan area where the player's team is located. We find that the white premium becomes higher in a metropolitan area where the median income gap of the citizen becomes *smaller*. Thus, increasing salary gap against black players in the NBA in the late 2000s and 2010s is not positively associated with non-shrinking income gap between white and black citizens

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1 Introduction

Racial discrimination in the National Basketball Association (NBA) league has attracted considerable attention in both the media and economics literature. For example, in April 2014, the owner of Los Angeles Clippers was banned from the NBA permanently and fined $2.5 million for his racism comments. Kahn and Sherer (1988) finds a strong white (20 percent) salary premium controlling productivity and other covariates using the salary data in the 1985–1986 season. On the other hand, several studies report that such a white salary premium decreased or disappeared in the 1990s (Dey, 1997; Hamilton, 1997; Bodvarsson and Brastow, 1998; Gius and Johnson, 1998; Erick Eschker and Siegler, 2004; Hill, 2004; Groothuis and Hill, 2013). Some studies report that in the 2000s, there was even a negative white premium against white players (Yang and Lin, 2012; Groothuis and Hill, 2013).

However, recently, making a long unbalanced panel data of salary and productivity covering 1985-2015, we find that while in the 1980s and 1990s there was no discrimination against black players, from the late 2000s, there was significant salary discrimination against non-white players (Naito and Takagi, 2017). More specifically, we find that white players are paid 20–25 percent more than non-white player with similar characteristics in the late 2000s and 2010s, and that this result is robust to many specification checks, such as quantile regression and controlling sample selection, type of contracts and foreign players.

A natural question arising from this finding is why racial discrimination started to arise in the NBA suddenly from the late 2000s.

Figure 1 shows the white premium of NBA players and income gap of white-black citizens in the last three decades.[1] The blue line shows the coefficient of white dummy

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[1]In our previous paper(Naito and Takagi, 2017), we compare the salary of white and non-white

when the natural log of the salary of each player in each year is regressed on white dummy after controlling a large dimension of productivities. Red line shows the median income ratio between male white citizens and male black citizens in each year. The red line shows that the white premium of NBA players started to rise in the middle 2000s. Interestingly, until the late 2000s, the median income ratio between white and black citizens was falling. However, since the late 2000s, it started to rise again.

One interesting hypothesis is that the increasing salary discrimination against black players in the NBA is related with the non-shrinking income gap between white and black citizens in the United States. If each citizen prefers to see NBA players of their own race and if a team is willing to pay a higher salary to a player whom wealthier fan want to see, the increasing salary discrimination against black players might be just a reflection of non-shrinking income gap between white and black citizens.

In this paper, we examine whether an increase of the racial salary gap between white and black players with similar characteristics in the NBA is positively associated with the income gap between white and black citizens by using the census data and salary data of NBA players. More specifically, we use census data from 1990, 2000, and 2010, which contain information on the income of residents of each metropolitan area where at least one NBA team is located. For each metropolitan area where at least one NBA team is located, we calculate the ratio of median income of black and white residents in the 1990, 2000, and 2010 census. Then, we check whether the white premium in the NBA is positively associated with the increasing income gap between white and black residents of the metropolitan area of the team to which the players belong.

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players. In this figure, however, we plot the white premium over black players with similar characteristics since the majority of non-white players are black and income gap of white and black citizen displays a similar pattern.

2   Datasets

We obtain information on the annual salaries of players from the ESPN salary-ranking website, the NBA's reference website, and a fan website. For indexes of performance, birthplace, nationality, height, weight, and birth year, we collect information from the ESPN website and the reference website of the NBA players.[2][3]

We pick up salary information of the season where the starting year of the season is equal to the census year (1990, 2000, 2010) or is 1 year before or 1 year after the census year.[4] The median incomes of white and black residents in each metropolitan area are calculated from the census data, which are available from IPUMS USA[5]. Because we map the ratio of the median income of each metropolitan area, which is calculated from the US census, to the salary data, we drop the observations of players who belonged to Canadian teams. We also restrict to white and black players.[6]

3   Empirical model

First, we estimate the following equation separately for three different periods (1990–1991, 1999–2001, and 2009–2011):

$$\ln S_{ijt} = \beta_0 + \beta_1 White_i + \gamma_1 X_{1ijt} + \gamma_2 X_{2i} + \gamma_j + \gamma_t + \varepsilon_{ijt} \tag{1}$$

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[2]The detailed explanation of the construction of the dataset is available from Naito and Takagi (2016).

[3]For indexes of the performance of players, we use the 16 indexes. Those indexes are discussed in detail in Naito and Takagi (2016).

[4]This implies that we pick up the 1990–1991, 1991–1992, 1999–2000, 2000–2001, 2001–2002, 2009–2010, 2010–2011, and 2011–2012 seasons.

[5]https://usa.ipums.org/usa/

[6]Since the majority of non-white player are black, our results does not change even if we include non-white and non-black players.

where i is the index of the individual; j is the index of the team; and t is the index of the season. White$_i$ is a dummy variable and it is equal to one if a player i is white and otherwise zero. To simplify the notation, we define the year t to year t+1 season as season t. As discussed in the preceding dataset section, we select the observation whose season is equal to the census year or 1 year before or 1 year after the census year[7]. $X_{1,ijt}$ are the indexes of performance in season t-1. To avoid an endogeneity problem, we control the performance in season t-1 instead of the performance in season t. X_{2i} represents the time invariant player characteristics, such as height. γ_j is the team's time invariant fixed effect. γ_t is the time fixed effect. β_1 is the white premium and shows the percentage premium of the salary of a white player over a black player with similar characteristics.

In the next step, we examine whether an increase of the white premium in the late 2000s and 2010s is associated with a change of income gap of white and black citizen. To denote three separate periods (1990–1991, 1999–2001, and 2009–2011), we write 1990–1991, 1999–2001, and 2009–2011 as the ar1990, ar2000, and ar2010, respectively. Let $T = \{ar1990, ar2000, ar2010\}$. Then, we estimate the following equation from the pooled dataset:

$$\ln S_{ijt} = \beta_0 + \sum_{k \in T} \beta_{1,k} White_i \times D_t^k + \sum_{k \in T} \beta_{2,k} White_i \times Std\_gap_{jt} \times D_t^k$$

$$+ \sum_{k \in T} \gamma_{1,k} Std\_gap_{jt} \times D_t^k + \gamma_2 X_{1ijt} + \gamma_3 X_{2i} + \gamma_j + \gamma_t + \varepsilon_{ijt} \qquad (2)$$

D_t^{ar1990} is the dummy variable indicating whether t belongs to the first period (1990–1991). It is equal to 1 if t=1990 or 1991, and 0 otherwise. D_t^{ar2000} and D_t^{ar2010} are

[7]The salary data of the 1989-1990 season are not available due to a dispute between players and the owners of the NBA.

defined in a similar way. Std_gap_{jt} is the standardized income gap between black and white citizens and is defined as

$$Std\_gap_{jt} = (gap_{jt} - \overline{gap_{jt}})/sd\_gap. \tag{3}$$

gap_{jt} is the median income ratio of male white citizens to male black citizens in year t in the metropolitan area where team j is located. $\overline{gap_{jt}}$ is the sample mean of gap_{jt}. sd_gap is the sample standard deviation of gap_{jt}.

$\beta_{1,k}$ measures the white premium in period k$\in T$ of players who belong to a team of which the income ratio of the white-black citizens of the metropolitan area is the national average. $\gamma_{1,k}$ measures the how much percentage the salary increases in period k$\in T$ when the income ratio of white and black citizen increases by one standard deviation. Our main interest is $\beta_{2,ar2010}$, which shows how much the percentage of the white premium increases in 2009-2011 when the income ratio of white and black citizens increases by one standard deviation. We expect $\beta_{2,ar2010}$ is positive and statistically significant. The term $\sum_{k \in T} \beta_{1,k} White_i \times D_t^k$ in equation (2) allows the coefficients of the white dummy to be different in three separate periods (1990–1991, 2009–2001, and 2009–2011). The term $\sum_{k \in T} \beta_{2,k} White_i \times Std\_gap_{jt} \times D_t^k$ allows the coefficients of the white dummy to be dependent on the income gap between white and black citizens in three separate periods. To calculate the median income in each metropolitan area, we restrict citizens to those aged from 23 to 60 years. For the season when the census is conducted, we use the census data to calculate the median income. For the season when the census is not conducted, we use the closest census data.

4 Results

Table 1 shows the estimation results. In columns (1)–(3), we estimate the white premium in three separate periods (1990–1991, 1999–2001, and 2009–2011). As shown in our previous study (Naito and Takagi, 2016), the columns (1)–(3) indicate that the white premium is statistically and economically significant only in the 2009–2011 period. Column (1) shows that in 2009–2011 period, white players were paid 31 percent more on average than non-white players with similar characteristics. In column (4), we estimate the white premium by pooling the three samples and allowing the white premium to vary in each decade. Column (4) shows that only the interaction term of white dummy and 2010s dummy is statistically significant. It shows that white players in 2009-2011 is paid 29 percent more, which is consistent with columns (1)-(3). Columns (5) and (6) examine the hypothesis that racial salary gap of the NBA is positively associated with income gap between white and black citizen. Columns (5) and (6) show that in an area where the ratio of the median income of white and black males is one standard deviation larger, the white premium is 9 percent *lower* in 2009-2011 period, contrary to out expectation. In 1990-1991 and 1999-2001 periods, the racial salary gap in the NBA is not associated with income gap between white and black citizen. In column (7), we assume that the error term is clustered at the metropolitan area$\times$ period.[8] We do so because Std_gap_{jt} is the same for the same metropolitan area and the same period. Column (7) shows that the statistical significance does not change even when we change the assumption on clustering. The results from columns (4)–(7) show that the salary gap of white and black players in 2009-2011 is not positively associated with the income gap between white and black male citizens, contrary to our expectation.

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[8]In columns (1)–(6), we have assumed that the error term is clustered for the same player.

5 Conclusion

In the late 2000s and 2010s, salary discrimination against black players became significant in the NBA. White players were paid about 31 percent more than black players with similar characteristics in the 2010s. Concurrently, around the mid-2000s, the declining trend in the white–black income gap stalled and from the late 2000s, started to increase.

This study examined whether salary discrimination against black players is positively associated with income gap between white citizens and black citizens. Contrary to our prediction, we find that the salary gap between white and black players is negatively associated with income gap between white and black citizens. This suggests that we need to look for different reasons that explain why salary discrimination against black players increased from late 2000s.

Table 1: Estimated Coefficients of Main Variables of Interest

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)
white	0.310***	0.0933	0.0239				
	(0.0969)	(0.0933)	(0.0775)				
white× dummy(2009-2011)				0.271***	0.293***	0.356***	0.356***
				(0.0887)	(0.0916)	(0.0988)	(0.106)
white×dummy(1999-2001)				0.0346	0.0475	0.0683	0.0683
				(0.0847)	(0.0955)	(0.103)	(0.105)
white×dummy(1990-1991)				0.118	0.107	0.00246	0.00246
				(0.0732)	(0.0739)	(0.0750)	(0.0750)
white×dummy(2009-2011)×Standardized income gap					-0.102*	-0.0980*	-0.0980**
					(0.0537)	(0.0527)	(0.0450)
white×dummy(1999-2001)×Standardized income gap					0.0442	0.0520	0.0520
					(0.103)	(0.102)	(0.0914)
white× dummy(1990-1991)× Standardized income gap					0.0300	0.0175	0.0175
					(0.0678)	(0.0595)	(0.0491)
season dummy × player characteristics	No	No	No	No	No	Yes	Yes
clustering level of the error term	player	player	player	player	player	player	area × period
sample seasons	2009–2011	1999–2001	1990–1991	1990–1991, 1999–2001, 2009–2011	1990–1991, 1999–2001, 2009–2011	1990–1991, 1999–2001, 2009–2011	1990–1991, 1999–2001, 2009–2011
N	873	885	481	2,239	2,239	2,239	2,239
R-squared	0.520	0.608	0.605	0.616	0.616	0.645	0.645

Notes: The sample is restricted to white and black players. The year t to year t+1 season is defined as season t. The dummy(2009-2011) is equal to 1 if the season is 2009, 2010, or 2011. The dummy(1999-2001) is equal to 1 if the season is 1999, 2000, or 2001. The dummy(1990-1991) is defined similarly. The data for the 1989 season are not available owing to a dispute between players and owners. Standardized income gap is the standardized ratio of the median income of white and black males aged 23–60 years. Clustering robust standard errors are in parentheses. All specifications are clustered at the player's level except (7). In (7), it is assumed that the error term is clustered within the metropolitan area × period, where period is defined as 1990–1991, 2009–2011, or 2009–2011. All regression specifications include the indexes of performance, weight, height, team fixed effect, and season fixed effect as additional explanatory variables. In addition, specifications (4)–(7) include standardized income gap ×period dummy as explanatory variables. *** p<0.01, ** p<0.05, * p<0.1
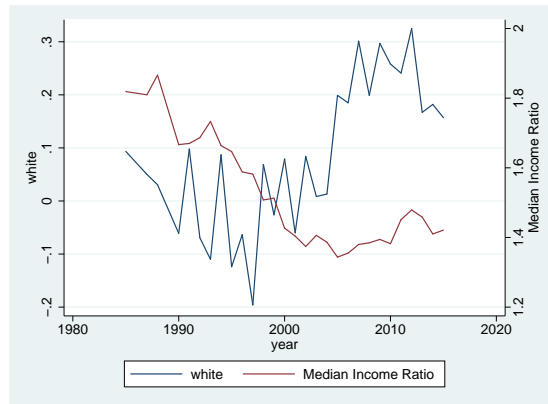
Figure 1: White at year t plots the coefficient of the white dummy when the log of salary is regressed on the white dummy and other covariates using the sample of year t in the NBA salary data. The sample is restricted to white and black players. The median income ratio plots the ratio of the median income of male white and black citizens aged 23 to 60 years, calculated from the CPS data.

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