



WILL HE STAY OR WILL HE GO? HOW MONETARY AND NON-MONETARY VARIABLES AFFECT THE NBA FREE AGENTS DECISION MAKING

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Abstract:

Objective: Different factors influence the National Basketball Association (NBA) players to sign a contract during the free agency. Top players have more power of choice during this period and are expected to have more options to choose from it. The purpose of this paper is to analyze the relationship between monetary and non-monetary variables on the decision made by NBA free agents, according to their salary.

Methodology: Our sample comprises 595 players who signed a contract with 30 NBA franchises between the start of the 2015/16 season and the beginning of the 2019/20 season. We employed descriptive statistics dividing the players according to salary quartiles and correspondence analysis.

Originality/Relevance: We analyze the relationship between on and off-court variables to the NBA free agents' transfers, which we identify as a caveat in the literature.

Main Results: Results indicated no predominant variable that dictates where a player will sign. The results also indicated a tendency for top players to take off-court variables more into consideration than on-court variables. However, there is not an advantage of monetary or non-monetary variables in the players' decisions.

Theoretical/methodological contributions: Our results suggest that players with higher salaries have more power to decide which team he will play next season and that this decreases as the salary decrease. Also, players with higher salaries have a higher chance of staying in their teams than players with lower salaries.

Keywords: Labor migration. NBA. Free agents. Basketball.

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ELE FICARÁ OU PARTIRÁ? COMO AS VARIÁVEIS MONETÁRIAS E AS NÃO MONETÁRIAS INFLUENCIAM A TOMADA DE DECISÕES DE AGENTES LIVRES DA NBA

Resumo:

Objetivo: Diferentes fatores influenciam os jogadores da National Basketball Association (NBA) que decidem assinar um contrato durante a *free agency*. Os melhores jogadores têm mais poder de escolha durante este período e espera-se que tenham mais opções para escolher. O objetivo deste artigo é analisar a relação entre as variáveis monetárias e não monetárias na decisão dos agentes livres da NBA, de acordo com seu salário.

Metodologia: Nossa amostra é composta por 595 jogadores que assinaram um contrato com qualquer uma das 30 franquias da NBA entre o início da temporada 2015/16 e o início da temporada 2019/20. Utilizamos a estatística descritiva dividindo os jogadores por quartis salariais e análise de correspondência.

Originalidade/Relevância: Analisamos a relação entre as variáveis de dentro e fora da quadra para as transferências dos agentes livres da NBA, que identificamos como uma lacuna na literatura.

Principais Resultados: Os resultados indicaram que não há uma variável predominante que dite onde um jogador irá jogar. Os resultados também indicaram uma tendência de os melhores jogadores levarem mais em consideração as variáveis fora da quadra do que as variáveis dentro da quadra. No entanto, não há vantagem de variáveis monetárias ou não monetárias nas decisões dos jogadores.

Contribuições Teóricas/Metodológicas: Os resultados sugerem que jogadores com salários mais altos têm mais poder de decidir em qual time vai jogar nas próximas temporadas e que isso diminui à medida que o salário reduz. Ademais, jogadores com salários mais altos têm maior chance de permanecer em seus times do que jogadores com salários mais baixos.

Palavras-Chave: Migração no trabalho. NBA. Agentes Livres. Basquete.

¿SE QUEDARÁ O SE IRÁ? CÓMO LAS VARIABLES MONETARIAS Y NO MONETARIAS AFECTAN LA TOMADA DE DECISIONES DE LOS AGENTES LIBRES DE LA NBA

Resumen:

Objetivo: Diferentes factores influyen en los jugadores de la National Basketball Association (NBA) que deciden firmar un contrato durante la agencia libre. Los mejores jugadores tienen más opciones durante este período y se espera que tengan más opciones para elegir. El propósito de este artículo es analizar la relación entre variables monetarias y no monetarias en la decisión de los agentes libres de la NBA, según su salario.

Metodología/Enfoque: Nuestra muestra está formada por 595 jugadores que firmaron contrato con alguna de las 30 franquias de la NBA entre el inicio de la temporada 2015/16 y el inicio de la temporada 2019/20. Usamos estadísticas descriptivas dividiendo a los jugadores por cuartiles de salario y análisis de correspondencia.

Originalidad / Relevancia: Analizamos la relación entre las variables dentro y fuera de la cancha para trasposos de agentes libres de la NBA, lo que identificamos como una brecha en la literatura.

Resultados principales: Los resultados indicaron que no existe una variable predominante que dicta dónde jugará un jugador. Los resultados también indicaron una tendencia de los mejores jugadores a tomar variables fuera de la cancha más que variables dentro de la cancha. Sin embargo, no existen ventajas de las variables monetarias o no monetarias en las decisiones de los jugadores.

Contribuciones teóricas y metodológicas: Los resultados sugieren que los jugadores con salarios más altos tienen más poder para decidir en qué equipo jugar las próximas temporadas y que esto disminuye a medida que disminuye el salario. Además, los jugadores con salarios más altos tienen más probabilidades de permanecer en sus equipos que los jugadores con salarios más bajos.

Palabras clave: Migración laboral. NBA. Agentes libres. Baloncesto

1 Introduction

In the sports scenario, the team's sporting performance is decisive. The management of the team, therefore, must seek positive sports results. On the other hand, financial performance needs to be addressed. The balance between these two is desirable, especially for long-term achievements (Guzmán, 2006).

Basketball is one of the most popular sports (Das, 2020). The biggest league, the National Basketball Association (NBA), attracts more attention and consequently benefits from an increase in its financial return, as brought by Gough (2020). The economic relevance of the NBA can be seen through teams' market values (Badenhausen, 2020a), solid sponsorships of world-renowned brands for athletes (Badenhausen, 2020b), and teams (Diven, 2017), add to the multimillionaire salaries for their athletes (Curcic, 2019).

When comparing their average, the multimillionaire salary contracts are higher than any other sports league (Gough, 2019), but they cannot be negotiated freely. The NBA Collective Bargaining Agreement (CBA) determines the rules. These rules dictate the relationship between athletes and the NBA teams, such as minimum and maximum contract value and salary caps (CBA, 2017). They were created to encourage competitiveness and equality among teams. Salary Cap was designed to prevent the wealthiest team from hiring all the best athletes and discourage equality among the teams (Goldrosen, 2018), similar to the financial Fair Play in soccer (Dima, 2015).

The CBA also dictates other rules like types of contracts and when they can sign them. According to them, it can be signed in two periods. During their contract, but only with the same team that they play or during the free agency period, in which he can sign with any team.

The free agency period is when "the front office has the opportunity to reconstruct their teams" (Rosen, Arcidiacono, & Kimbrough, 2016). Based on several variables, teams select the players that fit the best, for the best price, to build the best team possible, compete for better on-court performance, and have more financial returns, addressing the two primary goals. A team's success is just going to be seen at the end of the year. They will look at team performance, and the results on and off the court.

On the other hand, players try to find what is best for them, their best fit. Because of the player's short career, it is expected that they want to maximize their gains. Before the final decision, players will look at different variables when choosing where they will sign a contract. They will look at monetary variables, like net salary, off-court opportunities such as an

advertisement, and non-monetary variables like the location of the new team, city life quality, expected playing time, and talent level team (Rosen, Arcidiacono, & Kimbrough, 2016). Different from the teams, just numbers cannot measure players' success. For some players, success equals money, for others, championships are more important, and some prioritize the quality of life.

This paper aims to analyze the relationship between monetary and non-monetary variables on the decision of NBA free agents according to their salary. We analyze the relationship between state income taxes and the team's market value (monetary variables) and state human development index (HDI) and team's performance (non-monetary variables).

Considering players with higher salaries will have more power of choice, we expect that they will choose lower or equal state income tax based on Kopkin (2012) results, and teams with equal or higher market value. They are also expected to choose a team with an equal or better team record (Barajas & Rodriguez, 2010; Utgoff, 2002), and equal or higher HDI. On the other hand, players with lower salaries will not have this power of choice and end up signing with the rest of the teams.


Concerning the methodological aspects of our work, we analyze the correlation between salaries and the four variables (state income taxes, team market value, team wins in the previous season, and States HDI). Our results indicated that a higher team market value and higher HDI played a more significant role in the players' decisions than the other two variables.

This paper is organized into five sections, starting with this introduction: Literature Review, Methodological Procedures, Analysis of Results, and Conclusion. The literature review presents a theoretical foundation for Labor Migration, Monetary influences, and Non-monetary. The third section explains the methodology employed in the study. The results are discussed in the fourth section. Finally, in the fifth section, the conclusion about the results and final considerations are presented.

2 Literature review

2.1 Labor migration

"Labor migration is defined as the movement of persons from their home State to another State for the purpose of employment." (International Organization for Migration, 2008, p. 1). In sports leagues, the labor migration of players is widespread, and in the NBA, it is nothing different. While the causes and effects of labor migration are essential to the labor



migration literature, little research has been done on the impact of state and local income tax rates changes on high-income people's labor migration decisions (Kopkin, 2012). According to MacIntosh, Bravo, and Li (2020), globalization is one of the most important reasons for the crescent of migration.

Globalization is an essential part of basketball because, as expressed in Rojo et al. (2021), before the 1990s, the NBA did not have many international players when compared to the more than 100 players from 38 different countries playing in the NBA currently (NBA, 2019). Some even being top players of the league like Giannis Antetokounmpo and Luka Dončić (Favale, 2019).

Many players start migrating when they sign their first contract with a team at the beginning of their careers. During their careers, players can move to different places for different reasons, most of them are related to finding better opportunities for themselves, most of the time for economic reasons, as most migrations outside the sports world as brought by Rubenstein (2017).

The NBA has “rules restricting an open labor market for players’ services” as Maxcy and Mondello (2006) pointed out. They can migrate to different teams via trades (when it is not just their choice of where they will play, because most of the time, this decision mostly belongs to the teams) or via free agency (when players can sign wherever they want). The trades can happen because of a team option, seeking their primary goals (financial and/or sports performance) or because of a desire of a player that has become more common, as brought by Wright (2020), especially the top athletes that have more power of choice, because more teams want them. This player's desire to change is similar to those influencing their decision during the free agency.

From the player's perspective, reasons to change teams can be because of the amount of money received through the contract, location of the new team (off-court market opportunities, cities quality of life), expected playing time, talent level of the new team (Rosen, Arcidiacono & Kimbrough, 2016). So, the decision is based on monetary and non-monetary reasons, and can change from player to player.

2.2 Monetary influences

Because the career of a high-performance athlete is short, it is expected that he wants to maximize his earning potential during this period (Rosen, Arcidiacono, and Kimbrough, 2016).

The maximization of his earnings is the junction between what he earns with salaries during his career and his gains in off-court opportunities, for example, advertising, movies, and sponsorship. Sherry (1998) shows the importance of an athlete's marketing outside the court in maximizing his value, and Pickerell and Neault (2019) show the importance of engagement even after the career is over since athletes' careers are shorter than most professions.

Financially, athletes must seize opportunities and plan their financial careers (Neumann, 1988). Gayles and Baker (2015) pointed out that teams look for the best athletes to recruit, so better athletes have more chances to get a better opportunity. Better athletes are worth larger salaries for a team because they are more likely to help them reach their goals (financial or sports performance). For a sponsor, better-known athletes are worth more because the reach of the advertising, for example is more prominent and will have a better impact on the company. Thus, performance and recognition influence the values received in a player's career

"Based on lots of previous research, the salary in the National Basketball Association is determined by both personal characteristics and on-court performance" (Li, 2014, p.2). Players' salaries are tied to the financial and sports performance return that franchises expect them to bring for the organization. According to Lyons Jr, Jackson Jr, Livingston (2015), points per game, and rebounds are the most positively correlated variables of their performance to the salary. Teams and players negotiate their salaries based on the expected return, but this negotiation is not entirely free. Some rules, dictate all the players and franchises relationships (CBA, 2017).

Salary Cap tries to prevent the wealthiest team from hiring all the best athletes and discourage equality among the teams (Goldrosen, 2018), just like the financial Fair Play in soccer (Dima, 2015). There are two salary scales on the NBA. The rookie scale is predetermined, and usually, players and franchisees do not negotiate too much. On the other hand, the veteran scale is where players and franchises negotiate more because there are a minimum and max values tied to the salary cap (CBA, 2017). "The salary cap is comprised of Basketball Related Income (BRI), which consists of revenue generated from ticket sales, national and local broadcast deals, in-arena concession sales, signage, stadium naming rights, and merchandise sales" (Lyons Jr, Jackson Jr, Livingston, 2015, p. 2).

Even though the gross values are the same for all teams, since cities/states have different taxes, the net amount received by the player varies according to the team he is playing on, as shown by Rovell and Marks (2017). Thus, as a state by Heath & Crenshaw (2003) relocating to tax-free states is more benefic for the players. If the player wants to maximize his net amount

received, he will prefer the team that can pay him the most, with the least amount of taxes (Kopkin, 2012).

A luxury tax is imposed on teams that exceed the payroll cap by a significant amount. For each dollar that a club's payroll exceeds the luxury tax threshold, the team must pay one dollar to the league, which is then distributed evenly among the teams that have not surpassed the luxury tax threshold (Kopkin, 2012).

Salaries play a considerable part in player earnings, but most of their money can be made off the court. Money earned on the court is limited by the salary cap (CBA, 2017), but the money earned outside the court is "unlimited". The power of the athletes' brand dictates how much money he is worth for companies in sponsorships. His behavior, image (Mason, 2005), and the amount of engagement, interactions with fans, amount of likes in his photos (Lipsman et al., 2012) will determine the value of his brand.

A team can affect players' brand in many ways. A small market team does not have many nationally televised games, so the reach of a player's image can be affected (Dubin, 2019). According to NBA (2020), of the top 15 selling jerseys, only two are from players that play for a small market team and of the top 10 most popular team merchandise, just one is considered to be a small market team. Forbes (Badenhausen, 2020a) calculated the market value of a team based on values shown in its financial statements and helped to see how big the market is and its range.


The team can affect not just in their reach. It can also affect the player's image, like a losing team, translating to the players' image. It is not necessarily a monetary variable, but it will influence the player's value.

2.3 Non-monetary influences

"Money cannot buy everything." This is a quote from a Mastercard commercial, a song from Brave Combo, and even the main inspiration for the central question in an article (Gillespie, 2019). Gastal and Pilati (2016) explain the feeling of belonging, and Reker, Peacock, and Wong (1987) explain the importance of meaning, purpose in life, and psychological well-being. Those are feelings that money cannot buy and play a part in an athlete's life. So, there are non-monetary variables that can influence a player's decision of where he will play.

The primary purpose of a professional athlete, while he is playing, is seeking wins, championships, awards. Gill, Dzewaltowski, and Deeter (1988) show the difference in





competitiveness between professional athletes and nonprofessionals. The desire to become better players and to win are some reasons to why players work harder, sometimes even "creating" their mentality like Kobe Bryant (Jeffries, 2020) and sometimes even switching teams to seek achievements, like Kevin Durant when he joined the Golden State Warriors (Ibarrola, 2020).

Besides this purpose, for players well-being and feeling of belonging is essential for them to play alongside someone they enjoy, for an organization and city that they like and trust (Kumar and Meenakshi, 2009), even better when you combine this with a competitive team like LeBron James, Chris Bosh and Dwyane Wade did in 2010 (Tjarks, 2010).

Furthermore, there is the quality of life of an athlete and his close ones, which can change from city to city and can affect his performance as suggested by Sacha e Quinn (2011). The changes can be because of natural factors of the place, like weather, or related to public policy that affects their lives, like security, health, and education.

The Human Development Index (HDI) is a synthetic measure from zero (no human development) to 1 (total human development) used to classify the degree of economic development and quality of life. At present, the three dimensions that form HDI are Health, Education, and Income (UNDP, 2019). It can be measured by city, state, or country.

The decision of a player to migrated does not influence just the player, and there are several people involved that are influenced by his decision (family, friends, coaches). So, the quality of life of a city can influence a player's verdict of where he will play, just like it influenced one of the NBA's best players, LeBron James, according to Zillgitt (2018).

3 Method

To analyze the relationship between monetary and non-monetary variables on the decision made by NBA free agents, between the start of the 2015/16 season to the beginning of the 2019/20 season. The population consisted of 616 players that signed a contract with any of the 30 NBA franchises during the free agency period during the research period. Players who did not have a previous team were eliminated from the sample (21 players were excluded), as they always increase the variables, because previous team data is always 0 and when they go to a team, now HDI, Team market value, Tax and team performance is greater than 0. After we excluded these players, the sample consisted of 595 players.

All the data collection consists of secondary data. Information about the NBA free agents was collected at the website Basketball Reference, and players' salaries were bestowed at the website Hoops Hype. Forbes provided NBA teams' market value, Tax Foundation granted taxes related information, Global Data Lab provided HDI information, and Players and team performance sources were the official website of the NBA. For teams and players' performance, the results from the regular season were used.

Regarding methodological procedures, we analyze the data with four different strands. For the first part, we use a scatter plot and table analyzing the relationship between state income taxes and salary (Kopkin, 2012). We use the same approach to examine the relationship between team market value (Ertug & Castellucci, 2013), the team wins in the previous season (Li, 2014) and States HDI with salary. We subdivided the players according to their salaries into four groups based on their quartiles in all the analyses. Therefore, considering players' salaries, we subdivided players that earn between the minimum and 25% quantile, between 25% quantile and 50% quantile, 50% quantile and 75% quantile, and more than the 75% quantile. We segregated based on their salaries because the literature posits a difference between the power to negotiate contracts based on player salary (Kopkin, 2012).

Finally, we apply a correspondence analysis to verify the relationship between the variables. We transform the quantitative data into categorical data through quartile distribution (25%, 50% and 75%). Before applying the correspondence analysis, the chi-square test was executed. If there is a relationship between variables at a significance of 1%, the graphs are performed. These analyses were performed in R through the Ca package.

4 Research results and findings

The results section is divided into four parts. The first part is state income taxes, then teams' market value, then the teams' performance and, last but not least, states HDI. All topics discuss the influence on the decision of NBA free agents.

In Table 1, we present the descriptive statistics of our variables. Our sample comprises 595 players, 23 USA states and 30 teams.





Table 1.

Descriptive Statistics

	Min	25%	Median	Mean	75%	Max
Salary	37.196	2.098.555	4.767.000	7.757.202	11.181.285	37.199.000
Market Value	550.000.000	1.175.000.000	1.500.000.000	1.782.278.067	2.300.000.000	4.600.000.000
Taxes	0%	3,00%	5,00%	6,19%	9,00%	13,00%
Team Record	10	33	43	42	51	73
HDI	0,88	0,91	0,93	0,92	0,93	0,96

There is heterogeneity among team record, which reflects the sport performance in the season. Table 1 shows that we analyze players with high salaries and low salaries. We can see that by the difference between the mean and the median and by comparing the minimum and maximum values. Considering the taxes, we use data from 23 USA states and some states, as Florida, for example, do not have state-income taxes. On the other hand, there is a 13% state-income tax in California.

a. Salary and state income taxes

Figure 1 shows the results of the relationship between salaries and state income taxes. The results related to the scatter plot distribution show that players' distribution is roughly the same, independent of the taxes and salary. This result shows that, in general, players will not go to a team just because they have lower tax rates. They will spread all over the teams finding better opportunities, not just trying to find the team that will give them the most net value.



Figure 1.

State Income Taxes and Players' Salaries (2015/16-2019/20)



Notes: Data in thousands of dollars. Blue = 1Q, Orange = 2Q, Gray = 3Q and Yellow = 4Q.

Table 2 shows the labor migration of the athletes subdivided into quartiles based on their salaries, staying in teams with the same tax rate, or going to lower or higher tax rate teams.

It shows that most of the players in the quartile with bigger salaries (fourth quartile) stay with teams that have the same tax rate. About 18,94% goes to teams with a lower tax rate, and 29,07% goes to higher tax rates. The same conclusion goes for players who gain more than the median salary, most of them stay at teams with the same tax rate, and some players go to lower tax rate teams. The players that receive beneath the median salary look more often for teams with a lower tax rate and less to stay at the same tax rate.

Table 2.

State Income Taxes and Players' Salaries by quartile (2015/16-2019/20)

Salary Quartile	Increase in tax	Decrease in tax	Same tax
Quartile 1	9,24%	8,24%	7,56%
Quartile 2	7,39%	8,40%	10,42%
Quartile 3	7,56%	6,72%	9,58%
Quartile 4	7,23%	4,71%	12,94%
Total	31,43%	28,07%	40,50%

According to these results, the difference between players going to teams with higher and lower tax rates is small. Players that are in lower quartiles tend to switch teams more times than players in the higher quartile. There is a tendency for all players to maintain their tax rate,



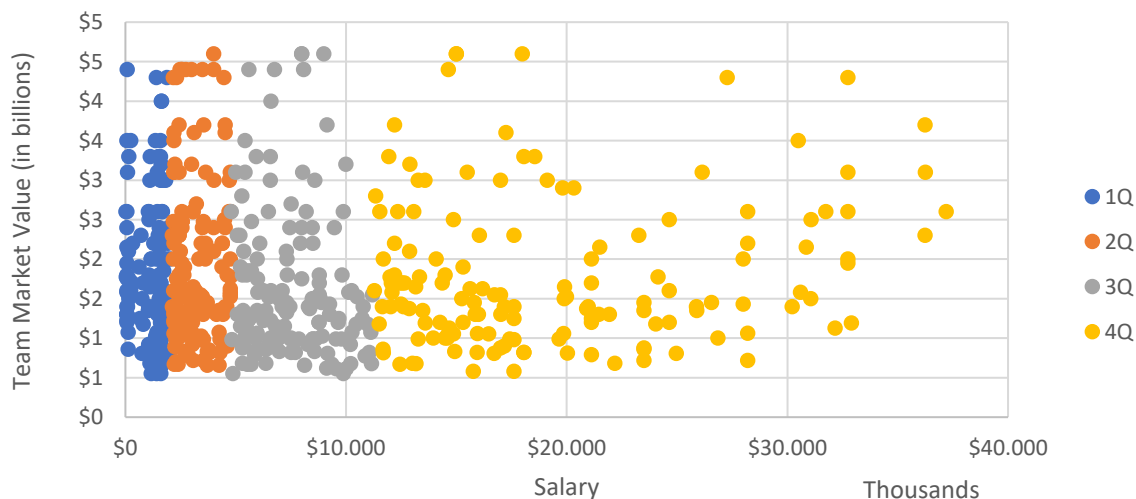
and not seek just the lower tax rate teams (the ones that will give them the most amount of net value). They will try to find better opportunities, but they will spread all over the teams, independently of tax rates.

b. Salary and team market value

The results of the relationship between salaries and teams' market value are shown in Figure 2. The graphic distribution shows a notable discrepancy between higher-paid athletes and lower-paid athletes. The distribution between lower-paid players is more balanced, tending to play more for smaller market teams than high-paid athletes. Notably, players who earn the most money tend to move away from the smaller market teams, concentrating on medium to high market value teams.

Figure 2.

Team Market Value and Players' Salaries (2015/16-2019/20)



Notes: Team market value in billions and salaries in thousands of dollars. Blue = 1Q, Orange = 2Q, Gray = 3Q and Yellow = 4Q

Table 3 shows the labor migration of the athletes subdivided in the same way as Table 1, but now, based on the team's market value. Furthermore, in Table 3, 72,75% of players that receive more than the median salary stay with the team or go to a team with a more significant market value. When looking at the fourth quartile (higher-paid players), the percentage of players that stay or go to higher market teams increases to 79,05%. In the same analysis, players that receive less than the median, the percentage goes to 66,91%, and when looking at players

at the quartile that receives the least amount of salary, the percentage falls to 61,1%. These results show a preference for the players to stay or go to higher market value teams. Those getting paid the most are more likely to go to those teams.

Moreover, players that receive more than the median salary tend to stay with the same market value teams (45,18%). This percentage increases to 52,03% when looking at the top 25% paid players. When looking at the quartile that gets a lower amount of money, this percentage goes up tends to change teams (74,52% of the cases). On the other hand, players tend to change teams more (68,22%) if they are below the median salary. They mostly go to teams with less market value than before (38,94% of all cases).

Table 3.

Team Market Value and Players' Salaries by Quartile (2015/16-2019/20)

Salary Quartile	Increase in TMV	Decrease in TMV	Same TMV
Quartile 1	8,91%	9,75%	6,39%
Quartile 2	9,08%	7,23%	9,92%
Quartile 3	6,72%	8,07%	9,08%
Quartile 4	6,72%	5,21%	12,94%
Total	31,43%	30,25%	38,32%

Note: TMV is an abbreviation for Teams Market value

Remarkably, players with more power of choice tend to stay with the team they are or go to high market value teams more often than players with less choice power. Players in the first quartile of salaries are more likely to play for smaller market teams. Another noteworthy analysis is that low-paid players are more susceptible to change, seeking opportunities to stay in the league.

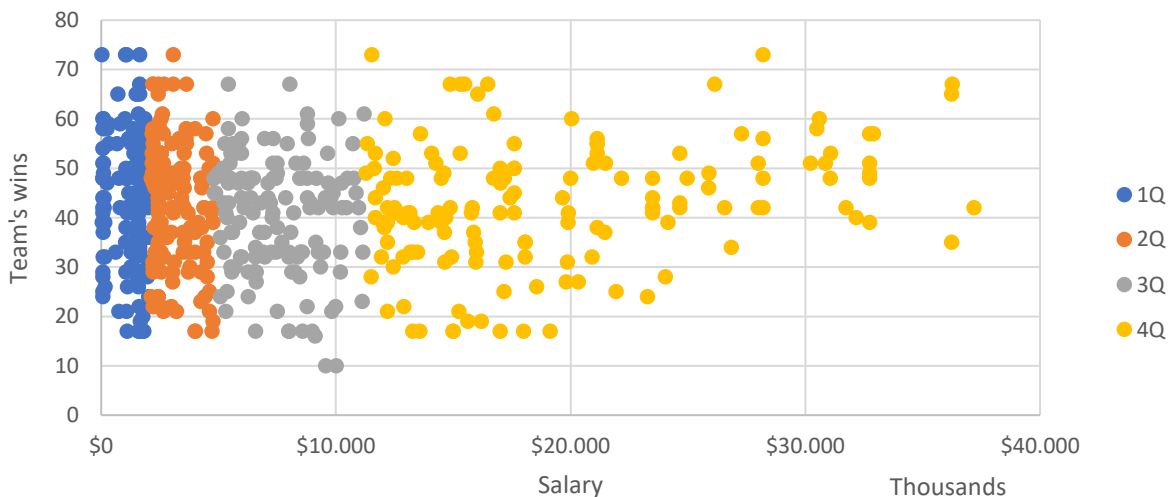
c. Salary and Team performance

The discrepancy in distribution is substantial when looking at the scatter plot of salaries x team record (Figure 3), just like the team market value. The distribution of points representing players from the lower quartiles is more similar than those players from the higher quartiles. Notoriously players who earn more money with salaries tend to play for better record teams and avoid the teams with the least number of wins. After the 25 million dollars' salaries mark, teams with less than 30 wins in the previous season do not attract the highest-paid players, as shown in Figure 3.



Figure 3.

Team Record and Players' Salaries (2015/16-2019/20)



Notes: Blue = 1Q, Orange = 2Q, Gray = 3Q and Yellow = 4Q.

Even though players of the fourth quartile tend to avoid the teams with lowest wins, when they change teams, they usually go to teams with the same or worst record (85,16%) as Table 4 shows. The critics behind a top player in the league going to a better record team (Tornoe, 2016) is a possible reason behind this. Another analysis is that as the quartile increase, the percentage of players staying with the same record teams goes up and players going to better record teams goes down.

Table 4 also shows that the difference between athletes going to a better and worst record teams is roughly the same. They change teams more often than stay with the team, with this statement not being true just for players of the fourth quartile.

Table 4.

Team Record and Players' Salaries by Quartile (2015/16-2019/20)

Salary Quartile	Increase in Record	Decrease in Record	Same Record
Quartile 1	11,93%	6,89%	6,22%
Quartile 2	9,24%	7,39%	9,58%
Quartile 3	6,05%	8,57%	9,24%
Quartile 4	3,70%	7,90%	13,28%
Total	30,92%	30,76%	38,32%

The results reveal a tendency of more changing of teams for players that receive less than the median salary. Furthermore, they look for better record teams more times than players



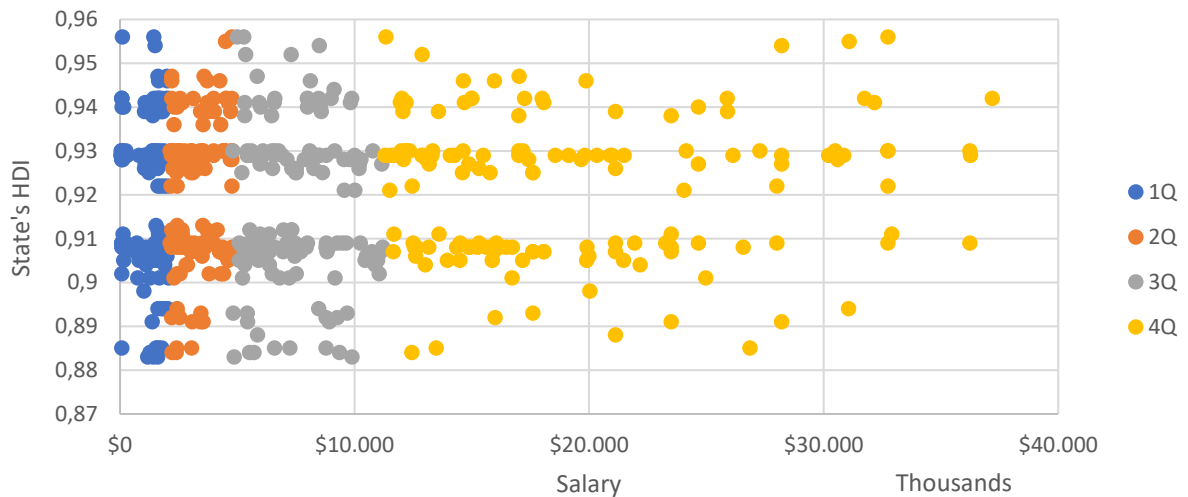
that receive more than the median salary. Players that are top paid, tend to avoid the worst record teams, but they also avoid going to teams with better record than they were before.

d. Salary and State HDI

The United States is one of the top 15 highest HDI countries in the world, according to UNDP (2019). It is expected that all the states have high HDI indicators as well. Even though this expectation is confirmed, states HDI are different, which can impact a player's decision. Figure 4 shows the scatter plot of the relationship between salaries and states HDI. According to the results, the distribution is almost the same for every quartile. There is a little difference between the fourth quartile and the others, which is fewer players below the 0,9 HDI mark, showing a discrepancy and a tendency to move away from the bottom.

Figure 4.

State's HDI and Players' Salaries (2015/16-2019/20)



Notes: Blue = 1Q, Orange = 2Q, Gray = 3Q and Yellow = 4Q.

Players who receive more than median are more likely to stay with teams that have the same HDI that they were before. At the same time, players that receive less than median compensation are more likely to find teams with higher HDI than they were before. Confirming the observation above, the decrease in HDI decreases as the salaries quartile increases, as Table 5 shows.

The athletes that are categorized as the higher quartiles tend to stay or increase the HDI (73,45%), which percentage even increases when looking at players of the top quartile

(79,05%). The opposite goes for players in the lowest quartiles when observing players who earn less than the median salary. They stay or increase the HDI just 65,57% of the time, and the percentage drops to 64,42% when considering the players from the lowest quartile.

Table 5.

State's HDI and Players' Salaries by Quartile (2015/16-2019/20)

Salary Quartile	Increase in HDI	Decrease in HDI	Same HDI
Quartile 1	8,57%	8,91%	7,56%
Quartile 2	7,06%	8,74%	10,42%
Quartile 3	6,39%	7,73%	9,75%
Quartile 4	6,55%	5,21%	13,11%
Total	28,57%	30,59%	40,84%

The results show a noticeable difference between low-paid and high-paid players. There is a tendency for high paid players to go to teams that are located in higher HDI states than lower-paid players.

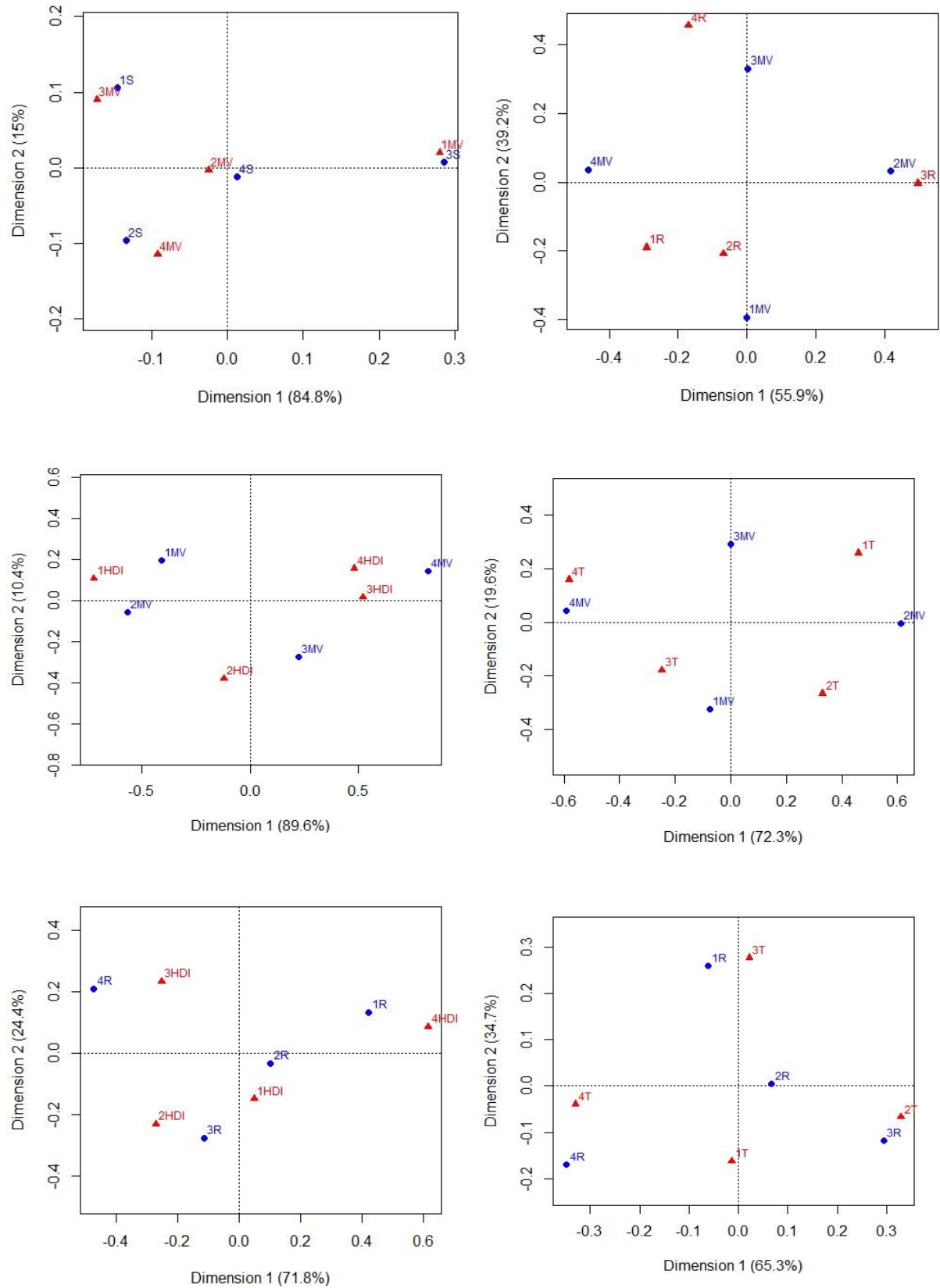
e. Correspondence Analysis

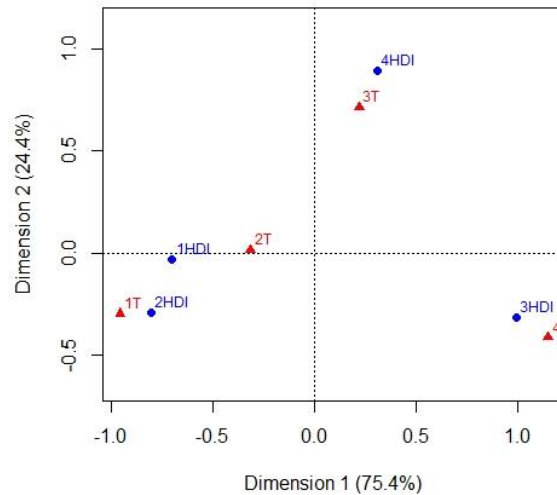
After calculating the chi-square test with 1% significance, 7 of 10 possible simple relationships are significant. The relationships between salary and record, salary and HDI and salary and taxes were not significant. Therefore, we could not perform a correspondence analysis in those relationships. We plot the graphs with the significant relationships in Figure



Figure 5.

Correspondence Analysis Graphs





Note: Plots from left to right, Salary and Market Value; Market Value and Record, Market Value and HDI, Market Value and Taxes; Record and HDI; Record and Taxes; HDI and Taxes.


Based on plots from Figure 5, especially the percentual related to the dimensions, it is possible to reject the null hypothesis of independent variables of the chi-square test. The value from the dimensions explains the relationship between the variables.

The results indicate that teams with the best wins record are associated with higher market values and higher-income states taxes. This result confirms what is indicated by Kopkin (2012), since in his study players with high salaries tend to states where there is lower income taxes. Consequently, players should consider that it is difficult to sign to a high-market value team, with a good win's record and low-income state taxes. Accordingly, the results suggest that states with HDI higher than the median are associated with higher income state taxes than the medium. Thus, states with a higher life quality, based on HDI, are associated with higher income state tax, and it will be difficult to consider those two as separate situations.

5 Conclusions

This paper aimed to analyze the relationship between monetary and non-monetary variables on the decision made by NBA free agents, according to their salary. The results indicated no preference for monetary or non-monetary variables. There is evidence that shows both influences a player's decision.

While measuring skill is challenging (Kopkin, 2012), we can estimate the value that NBA clubs place on various player characteristics by using annual compensation on a free



agent's career statistics before to signing his contract. Our results suggest that the more salary a player receives the more deciding power of where to play they have. According to the results, the salary cap show efficiency. Despite the state's tax rates being different for the teams (players do not receive the same amount in net value), it works because a team cannot sign all the best players. The same goes for team performance.

High paid players tend to avoid the lowest wins teams, but no evidence shows that a player decision is based mainly on the team record. There is a roughly similar distribution between the players in every salary category and teams. It also shows that lower paid players are more susceptible to changing teams than high paid players, who tend to stay with the teams that they were currently playing.


Off-court variables, the ones that are more related to outside opportunities, like team market value and quality of life (HDI), appear to have more influence than on-court variables, the ones more related to players performance, salary (tax) and team performance. Higher team market value corresponds to better off-court opportunities, and higher HDI corresponds to a better quality of life. These variables seemed to play a significant role in players' decisions, especially for players who receive a higher salary. They tend to avoid smaller values of these variables. The players' inertia is notable, that is, the tendency of players to stay in the club, especially those who earn higher salaries.


The restrictions of this paper are the period of analysis and state-only analysis (income taxes and HDI). Also, we do not employ multivariate techniques, such as multiple regression, limiting our conclusions to bivariate techniques. Finally, we could not generalize to other contexts because we only use data from NBA.


Future studies could increase the period of analysis to have a larger sample. It could analyze different sports (football, hockey, baseball) and other countries, thus making comparisons. It could include local tax rates and local HDI. It could include player performance variables to explore the part of salaries being related to the players' performance.

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