

The MRP and Salary analysis of Miami Heat Players, 2022-21

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The data project aims to investigate the economic value of players using player statistics and each player's payroll based on complex invasion sports. Our analysis involves one of the teams from the National Basketball Association (NBA) which is the Miami Heat of 2021-22 i.e. the 76th season of the NBA league. The analysis builds in-depth on the previous literature based on the relationship between a player's performance (marginal physical product) and marginal revenue of output (MRQ) of a player to determine how an individual is valued in the sports industry. Each player is evaluated on what is called a Marginal Revue Product (MRP), the information helps with the distribution of athletes' salaries and players' future draft status.

To begin with, for the Miami Heat, the statistics have been converted from a player on court value into Marginal Revue Product (MRP) using the PIPM (Player Impact Plus-Minus) the method that comprises the scores, On-off and net ratings etc. The PIPM method uses per-36-minute gameplay, where a team possession may differ so, as it is assumed as per-100 possession (I.e. approximately per 48 minutes). An effective method helps to develop the MRP of players. In the 2021-22 playoff season the NBA league average of Offensive rating (ORTg) and defensive rating (DRtg) is 112. Miami Heat as a team had an Offensive rating (ORTg) of 113.7 and a defensive rating (DRtg) of 109.1 with a net rating being equivalent to +4.6. Based on the league average we can determine that Miami heats have an Offensive rating above average however the defensive rating is below average in the NBA League. As there are 15 players in a roster team in the NBA playoff season of 2021-22 and 41 wins per team on average (i.e., 50 percent of the NBA games) which implies 2.73 average wins per player. We use this method to compare each player's win conversion to MRP. The box number is used to convert the PIPM value to wins by using Pythagorean Wins Formula. And using the Scully-based method and the regression table coefficient value of wins and win-

lagged help in determining the actual MRP of a player in dollars. There are various methods to determine a player's MRP. We calculate the MRP it is observed that the Miami Heat has only 4 players who are paid higher than their MRP. The average NBA salary in 2022 was \$8.5 million

Firstly, based on the MRP calculation of players from the Miami Heat for the NBA season 2021-22 we observe Jimmy Butler is one of the highest-paid players of the Miami heat with the highest MRP of \$17.8 million. In 2021-22, Jimmy Butler earned \$36 million so he was overpaid and based on the future contracts he will be overpaid for the next two years. Jimmy Butler is a true asset as he produces 8.55 wins above average. The reason he's the highest-paid player in the Miami heat is because of his experience, awards and consistency in performance. Moreover, he has also been honoured with an All-NBA team title bestowed on him twice in consecutive years before he signed a contract with Miami Heat and because of the reputation that results increased in the future pay.

Bam Adebayo of the Miami Heat had an initial contract in which he was last paid the amount of \$5 million in 2020-21. However, since his new contract was renewed, he was paid \$28 million in 2021-22 so suddenly being a player who was underpaid is now overpaid. As Bam's current MRP was \$18 million. he produces 9.38 wins above average, one of the highest wins-producing players. Many oppose the idea of Bam being overpaid, however, due to his excellent performance and wins above average. Moreover, it was observed young players like Bam Adebayo can be paid higher than his MRP since he started from the rookie contract in 2017 and Heat saw potential in the player he is being paid and will be paid higher under his new renewed contract. Bam Adebayo has also committed himself to a five-year long-term contract could be the reason he is being overpaid as players can be exploited under long-term contracts with the skills to offer.

Furthermore, another player who was overpaid was Kyle Lowry who is known for playing with the Toronto Raptors for a decade however due to personal matters he had signed a contract with the Miami Heat but still he one of the overpaid players. Kyle Lowry earned approximately \$26 million in 2021-22 with his MRP being calculated as \$17 million. Some fans were concerned with his age of players however at the same time a trio of Lowry, Butler and Adebayo could have a super high ceiling and could compete against the best teams in the NBA regular season. To argue players are overpaid is to attract fans and media, as they rely on having “the best” athletes where teams have the opportunity to earn revenue via the popularity of players.

Finally, the fourth player who we discuss is Duncan Robinson earned 15.5 million in 2021-22. Initially, he was underpaid with a value of \$1.6 million in the year 2020-21. After Joining Miami Heat from the NBA draft his salary hiked. As per 2021-22 data he produces 2.97 wins above average which indicates a promising efficient player for Miami Heat. Also, he signed a \$ 90 million multi-year contract in 2021 for the next 5 years. Nevertheless, there are other players with better wins per share higher than Duncan Robinson but players create value for teams other than by promising wins, and the MRP calculating method won't analyze specific skills such as accuracy skills and popularity for Duncan Robinson is known for their elite skill: Shooting the basketball.

Tyler Herro is also one of the recent emerging players with a fan base saying he is paid fairly, however, the statistics of Box-PIPM which produces wins which say otherwise. He produces 6.94 wins above average. He has an MRP of \$16 million however in NBA 2021-22 season he was paid only \$4 million i.e., he was highly underpaid. However, under the new 4-year contract with the Miami heat starting in the year 2023 he is going from being underpaid to overpaid (that is \$27

million in 2023-24 and increasing further) because of Heat's optimism in his potential to generate wins in the future games.

One of the major factors seen in players like Tyler Herro, Haywood Highsmith, and Omer Yurtseven are initially underpaid because of age factors. As age plays a crucial role in player selection from the NBA draft. Based on the trend it is observed that young players are extremely volatile in terms of talent and performance and NBA investors don't like to gamble a team's performance and money on a newbie as a result they are paid a lower amount for few years until the players show consistent performance and awards for individual excellence.

To conclude apart from the players mentioned above most of the players are underpaid. The attached data spreadsheet for all 22 players of the Miami Heat with their MRP, wins per player and actual amount paid in the NBA season 2021-22. Firstly, It can be deduced that the majority of the players are underpaid because a fan might stratify into "stars" and "non-stars" if players are based on popularity and the face value of a player might encourage teams to pay higher salaries than their MRP. Secondly, a player's MRP can be equivalent to zero if he is seriously injured and there might be a risk to the team's future playoffs. Economically, the team might be worse off as it will be a loss to the team. Hence, MRP is a viable option to measure MRP to determine the salaries of players. However, there might be other elements which can affect the salary.

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