The Case Against NBA Individual Maximum Contracts

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1 Introduction

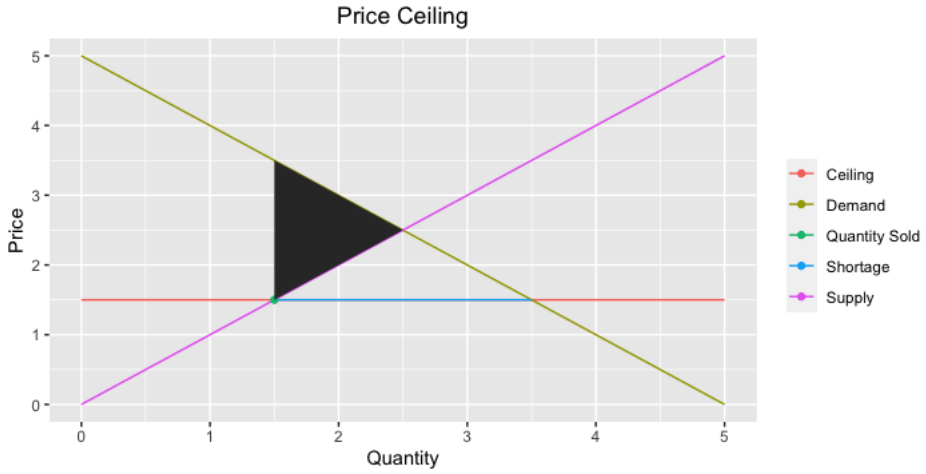
When Chris Bosh, LeBron James, and Dwayne Wade joined the Miami Heat in the summer of 2010, many fans complained about the players' decision to form a superteam. LeBron James has been widely blamed for starting the NBA superteam trend and the imbalance of power in the NBA. In reality, the NBA rules which made LeBron's superteam possible began long before 2010. The rule change key to the formation of NBA superteams was the introduction of individual max contracts in 1999.

The NBA max contract was born as a result of Kevin Garnett's six year, $126 million contract signed during the 1997-98 season. Owners felt that Garnett's contract was too large, causing a lockout at the start of the 1998-99 season. After negotiations between players and owners subsided, both sides agreed to an individual max contract rule in the 1999 Collective Bargaining Agreement (CBA) (Chandler 2016). The individual max contract has remained in place to the present day.

The amount of a player's individual maximum contract is determined by the league salary cap and a player's level of experience. In the first year of their contract, players with 0-6 years of experience can be paid up to 25% of the salary cap, players with 7-9 years of experience can be paid up to 30% of the salary cap, and players with over 10 years of experience can be paid up to 35% of the salary cap. There are a few exceptions to the age cutoffs, such as the Derrick Rose rule which allows players who are awarded MVP, Defensive Player of the Year, or All-NBA honors to receive first year contract salaries up to 30% of the cap before they turn 25. Teams can offer these contracts with up to 8% increases each year (Urbina 2018).

Under standard economic theory, NBA max contracts function as a wage ceiling in the labor market for players. In competitive markets, price ceilings above the equilibrium level cause demand to exceed supply, creating a shortage. Figure 1 shows the effects of a price ceiling in a perfectly competitive market. The shaded region shows the deadweight loss, or loss to total surplus, from the price ceiling.

Figure 1



The price ceiling in the above graph can be interpreted as the individual max contract rule, which lowers the wage of superstars below the equilibrium level and results in a shortage for superstars and deadweight loss. As demand for the services of superstars far exceeds the supply, most competitive teams are willing to pay a superstar the maximum contract. Securing the services of superstars is the key to forming elite NBA teams, since they generate considerable value above their maximum contract wages. However, not all economists agree that superstars are the key to winning championships. A paper by Berri and Jewell found an insignificant effect of wage inequality on team performance, which the authors used to argue that overall team quality, not superstars, is the key to team success (Langelett 2006). However, this paper used a dataframe spanning 1996 to

2002, and the individual maximum contract was not introduced until 1999. Since nearly every team is willing to pay superstars the maximum, superstars have the power to choose between teams. Top NBA players generally prefer to play in larger cities. Thus, the individual max contract rule makes it difficult for small market teams to acquire and retain superstars.

An important effect of the NBA max contract rule is that it results in increased salaries for second tier players, especially relative to superstars. An empirical study found a significant increase in the salaries to teams' second and third highest paid players following the introduction of individual max player contracts with the 1999 CBA (Hastings and Stephenson 2014). Players whose value is just above that of the max contract receive the same compensation as players such as Kawhi Leonard whose value far exceeds the value of a maximum deal.

There are several practical issues which make the NBA max contract rule difficult to abolish. For one, players and owners have continued to agree on max contract rules despite numerous renegotiations of the Collective Bargaining Agreement (CBA). Owners pushed for the individual max contract rule in the first place, which works in conjunction with the salary cap to limit their payroll. Many pundits believe the NBA players' association would likely oppose the removal of individual max contract rules since these rules keep the salaries of second tier max players high (Lowe 2014). However, players may support a more unrestricted labor market since it would result in a more meritocratic salary distribution (Modi 2018). While superstars in the NBA are underpaid, they are unlikely to drive a change. For one, while superstars have a role in the player's association, their role is relatively small. Additionally, superstars are able to acquire vast amounts of money through endorsements, which may curb their desire for larger contracts (Pagels 2016). However, if maximum contracts were abolished, superstars would likely accept an increase in their salaries.

2 Methodology

2.1 Model

Consider a team deciding how much to pay players A and B in the next year. The team has a remaining salary of M dollars, and a maximum contract is worth w dollars in the first year. Furthermore, suppose player A is a superstar who generates value a for the team, and player B is another star player who generates value b for the team, where $M > a > b > w$, $a+b > M$, and $2w < M$. Since both players generate value above the maximum contract, they will each receive w, and the team's surplus will be $(a-w)+(b-w) = (a+b)-2w$. Total surplus will be $(a+b)-2w+2w = a+b$.

Now, suppose the the individual max contract rule is removed. Assume both players are unwilling to work for less than their value. Since player A is better than player B, the team will sign player A for a. The team can not afford to sign player B with the $M-a < b$ remaining, so player B will sign with another team that can afford his market value b. The team's surplus will be 0, and total surplus will be $a+b$. The total surplus in the this case will be the same as the surplus generated with the max contract rule, but in this case the surplus will all go to the players rather than being split between the players and the team.

This model shows the fundamental argument against maximum contracts. In the case with the maximum contract rule, both players A and B receive a maximum contract, potentially forming a superteam, as seen by the large team surplus $a+b-2w$. Without maximum contracts, the two players go to different teams, each receiving their market value in wages. No superteam is formed,

and player surplus is greater than with the individual maximum contract rule. The only party worse off is the team, which will receive less surplus from the players and will be less likely to form a superteam. This model shows that individual max contract rules transfer surplus from players to teams.

This model illustrates the role maximum contracts play in lowering superstar wages and making superteams possible. Under the framework of this model, the introduction of individual max contracts in the 1999 CBA can be seen as a transfer of rents from superstars to lower tier players and teams. Empirical work has supported this assertion that the individual max contract represents a transfer of rents away from superstars (Stephenson and Hastings 2014).

2.2 Empirical Strategy

The data source for my empirical analysis is Basketball-Reference.com, a well-known source of basketball statistics. I downloaded data on individual salaries for 491 players. Additionally, I downloaded data on win shares, minutes played, and Player Efficiency Rating (PER) for these players. Win shares is an advanced statistical metric which estimates a player's contributions to team wins over the course of the season. I use win shares as a proxy for player performance in the 2020-21 season up to May 16th, 2021. A shortcoming of win shares as a measure of performance is that it increases with minutes played. An elite player who has suffered an injury in the 2020-21 season, such as LeBron James, will have relatively lower win shares than a player of similar caliber who has played more minutes. This possible shortcoming with win shares data led me to download minutes played data, which I used as a control variable in my regressions. Player

Efficiency Rating (PER) is a metric developed by ESPN.com's John Hollinger designed to measure a player's efficiency. While PER overvalues offense and undervalues defense, it is a well-respected measure of player's per-minute contributions, and was an important control variable to include in my study (Basketball-Reference.com 2021).

I used the following equation in three regressions to estimate the relationship between salary and win shares in the 2020-21 season:

$$wins_i = \beta_1 PER_i + \beta_2 minutes_i + \beta_3 salary_i + \varepsilon_i$$

$Wins_i$ represents the win shares generated by player i and PER_i represents player i's player efficiency rating, $minutes_i$ gives the minutes played by player i, $salary_i$ gives player i's salary as a percentage of the salary cap, and ε_i is an error term. β_3 gives the impact of salary on win shares, which is my coefficient of interest. Specifically, I wanted to see whether the relationship between salary and win shares was different between lower caliber players and max contract players.

I ran this regression equation on three subsets: all players, players whose salary exceeds 25% of the cap, and players whose salary does not exceed 25% of the cap. I used a salary over 25% of the cap as a proxy for max contract players. This proxy is a decent approximation for the cutoff for maximum contracts, since 25% of the salary cap is the maximum first year contract for players with $0-6$ years of experience. Players with over 6 years of experience are eligible for higher salaries, so this proxy does not work perfectly for experienced players. However, 25% is a reasonable cutoff to be used as a proxy for maximum contracts.

3 Results

Figure 2

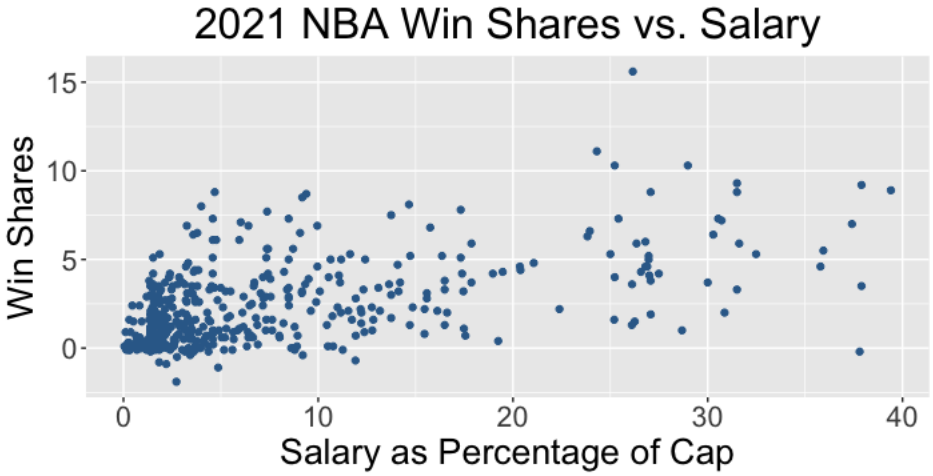


Figure 2 shows the relationship between win shares and salary as a percentage of the cap for the 2020-21 season. There appears to be a positive relationship between win shares and salary. High salaries seem to produce an extremely high range of win shares. The wide range of win shares produced by high salaries is consistent with the theory that max contracts are given to players who generate vastly different outputs. Max contracts lead to superstars getting underpaid and lesser players being paid more. Another explanation for the wide variation in win shares for players with high salaries is that some high salary players played relatively few minutes due to load management or injury. While the graph of win shares versus salary does not contain control variables, I included control variables in my regressions, whose results are shown in Figure 3.

Figure 3

Win Shares vs. Salary

	All Players	Players with Salaries over 25% of Cap	Players with Salaries under 23% of Cap
Predictors	*Estimates*	*Estimates*	*Estimates*
Intercept	-1.87 *** (0.16)	-7.06 *** (1.72)	-1.52 *** (0.15)
PER	0.13 *** (0.01)	0.46 *** (0.05)	0.11 *** (0.01)
Minutes Played	0.00 *** (0.00)	0.00 *** (0.00)	0.00 *** (0.00)
Salary as % of Cap	0.03 *** (0.01)	-0.06 (0.05)	0.02 (0.01)
Observations	455	39	415
R^2 / R^2 adjusted	0.706 / 0.704	0.841 / 0.827	0.675 / 0.673

** p<0.05 ** p<0.01 *** p<0.001*

The first column shows the regression results for all 491 players in the dataset, the second column shows the results for the 39 players with salaries over 25% of the cap, and the last column shows the results for players with salaries under 25% of the cap. The coefficients on *PER* are all positive and significant, which shows that player efficiency rating is a significant predictor of win shares. The coefficient on PER is greater for high salary players, which may be because less of the variation in win shares for these players is explained by salary. The coefficients on minutes played are all positive and significant, though small in magnitude. Minutes played is an important control variable since it differs from *PER* and is an important predictor of win shares.

The coefficient on the *salary* variable is positive and significant in the regression run for the data set over all players, showing a positive relationship between salary and win shares for all players. The value for this coefficient is negative but not significant for players with salaries over 25% of the cap, and positive but not significant for players with salaries under 25% of the cap. The insignificant coefficient and high standard error for high salaried players shows that there is little correlation between salary and win shares for max players. Among maximum salary

players, players with more experience are eligible for higher salaries. Thus, experience is a better determinant of the differences in salaries for maximum contract players than win shares. The insignificant, positive coefficient on the salary variable for players with salaries under 25% of the cap is surprising. It is worth noting that this coefficient is close to the significant level. There may be collinearity issues between the salary variable and PER variable which cause this coefficient to be insignificant.

4 Interpretation

Salary predicts player win shares better when considering all players than when considering players with salaries over or under 25%. This result may indicate that there is a substantial gap between max contract and non-max contract players in ability level, but differences within each salary bracket are not well predicted by salary. One potential reason for the insignificant coefficient on the salary variable for players' salaries under 25% of the cap are rookie contracts. Players sign rookie contracts when they come into the league, and these contracts can lead star players to be underpaid near the end of their rookie contracts. For example, Nikola Jokic went from being paid $1.47 million in in the 2017-2018 season to $24.61 million in the 2018-2019 season after his rookie contract expired. His win shares increased from 10.7 to 11.8, which is a considerable improvement but disproportionately small compared to the 17 times increase in his salary (Basketball-Reference.com).

My results suggest that salary is not significantly associated with win shares for max contract players. Since max contract levels are determined by experience, not player ability, salaries

do not accurately reflect player productivity. Salary's insignificance in predicting win shares output for max contract players may be due to to the max contract rules, but also may be affected by other frictions in the NBA labor market. Contracts for top tier players are often long term, so they may not update with performance. Additionally, teams may sign players to max contracts for reasons other than production. For example, many analysts thought that the Los Angeles Lakers overpaid Kobe Bryant in the later years of his career despite his declining production out of respect for his earlier achievements (Abbott 2011). While there may be additional factors which cause higher contracts to not predict win shares, the max contract rule plays a key role in salary's failure to differentiate between top tier players.

5 Conclusion

NBA max contract rules are inefficient, and transfer surplus away from superstar players to teams and lower tier players. While deciding the ethics of this transfer of surplus away from superstars is a normative question, the empirical evidence shows that maximum salaries do not accurately compensate superstars for their value. These rules cripple small market teams; superstar players who can receive a max contract from any team will choose a team based on other characteristics, such as market size or other superstars on the roster. To reestablish parity in the NBA and more fairly compensate players for their production, the NBA should abolish maximum contract laws.

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