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Analyzing the Correlation Between Offensive and Defensive Efficiency in the NBA

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Introduction

There has always been great debate among NBA coaches, fans, players, and executives as to whether offense or defense has a greater effect on the outcome of a game. The widely known phrase defense wins championships plays into this argument but many seem to have switched their stance preferring offense instead. NBA analyst Kenny Smith even went as far as to say “Good offense will always beat good defense.” This debate is one of the key factors that is pushing this research. Two of the major statistics in deciding how good an offense or defense is are called offensive and defensive efficiency respectively. Essentially these ratings give a numerical value to how good an offense or defense is. While not all inclusive these statistics can give a good and quick overview of how well a team is performing on either side of the ball. Many believe that honing in on offensive efficiency will lead to winning more games in the NBA while others will say the same about defensive efficiency. The purpose of this study is to find if there is a measurable correlation between these two statistics and discuss factors or variables involved.

Literature Review

Offensive and Defensive Efficiency Defined

Offensive Efficiency whilst a commonly referenced statistic most would not be able to properly define exactly what goes into finding the number. Thus so that everyone reading is on the same page the formula that will be used to calculate Offensive efficiency will be as follows; $\text{field goals attempted} - \text{offensive rebounds} + \text{turnovers} + (0.4 \times \text{free throws attempted}) = \text{total number of possessions for the season}$ (Burrows, 2019) then take the total number of points scored on the season divided by

the number found in the first step. This should give you a number around 1.00 multiply this number by 100 to get offensive efficiency.

In the same vein defensive efficiency can be calculated as follows; field goals attempted - offensive rebounds + turnovers + (0.4 x free throws attempted) = total number of possessions for the season (Burrows, 2019) divide total number of points by the total possessions of the season. This will give a similar number around 1.00 which will be multiplied by 100 to give us defensive efficiency. Understanding these numbers can be a little more tricky but in general for offense a number above 100 is good and for defense a number below 100 is good.

The National Basketball Association has transformed into an offensive powerhouse as defense has become something of an insignificant and rarity skill over the past couple of years. There have been scoring surges all over the league with “14 50-point games” (Staff) already taking place midway through the 2022-2023 season, as well as a 60-point game and a 70-point game. This year the average NBA team is “scoring at a rate of nearly 114 points per 100 possessions” (Staff) at the midway point this year, being the most efficient in league history to the halfway point. How has this explosion of offensive efficiency affected the defensive efficiency over the past twenty years? There are many reasons as to how they correlate whether that be efficiency of the stars, efficiency of the rookies, hot shooting, shooting percentages, and other factors.

Offensive efficiency is based on the average number of points per possession of a team. One factor that correlates to the number of points scored and what makes a team more offensively efficient is free throws. Free throws are one, two, or even three 1

point shots that a player gets to take if a shooting foul is called. The 'hot hand' is a term coined for a player who is making consecutive field goals and seems to never miss in a stretch of the game. Free throws are an area of the game where offenses can capitalize and increasingly be more effective. With that Lantis began to do research on the 'hot hand' revolving around free throws. Research found that a player who makes a set of free throws increases their chance to make the next pair by 2.0 percentage points. That then turns into 4.5 percentage points and continues to increase to 6.2 percentage points (Lantis). Focusing on the 2003-2004 NBA season, each team has a statistic looking at the overall free throw percentage made. The top five teams were the Dallas Mavericks at 79.4%, Sacramento Kings at 79.1%, New York Knicks at 78.9%, LA Clippers at 78.5%, and Minnesota Timberwolves at 78.1%. Taking a look at the last full season which was the 2021-2022 season, the top five teams were Philadelphia 76ers 82.4%, Chicago Bulls 81.4%, Boston Celtics 81.1%, Atlanta Hawks 81.0% and Miami Heat 80.7% (TeamRankings n.d.). The data shows that current teams are increasingly more efficient than the teams from nearly 20 years ago. Players are getting to the line more often than ever and it has led also to players becoming more efficient at the line.

A factor on why the team's free throw percentages increased over the years relates back to the 'hot hand', player's are focusing more on free throws as they are crucial points for the team. The more they focus on the free throws they begin to make more and the 'hot hand' effect comes into play as the more they make, the more likely they are to make the next set of free throws.

Research looked at the three point shot and when it became popular, while the findings suggested no abrupt increase in the three point shot, one finding showed that

individual three point attempts increased with respect to position. In the 1996-1997 season 3.94 3 point shots were attempted on average each game for an individual. The article then looked at the most recent NBA season and found that in the 2018-2019 season the average increased to 6.33 3 point shots per individual in a given game (Freitas). The three point shot since being added has shaped and changed how teams play when coming to scoring, while the three point shot has not taken over in terms of popularity, individuals and teams are starting to incorporate it more into their offensive plays. To further the connection to the 3 point shot to offensive efficiency statistics from teamrankings shows the overall 3pt shot percentage for every team in the NBA. In 2003-2004, the earliest NBA season recorded on the website, showed every team was in the 30 percentile for made threes. In 2021-2022, the last full NBA season, found that every team was in the 30 percentile for made threes. While the percentages are the same for made threes, more threes are being taken by individuals. This leads to more scoring and higher offensive efficiency than that of offenses 20 years ago.

Technological Advances

Technology seems to become a more and more prevalent thing in the world of sports and particularly basketball. NBA teams are now able to track their stats, percentages, and even rewatch plays that happened moments before within seconds of it happening. Technology has allowed teams to max their potential and see and learn what they are doing and what they need to improve on in a way that no other era has been able to do before. Practice facilities have been loaded up with technology to do this. Phoenix Suns have installed “150 cameras, nodes and sensors in the ceiling and on the walls of the practice courts — the Suns had just four cameras at their previous

practice facility — and working with Verizon to create a single app using 5G Ultra Wideband speeds for legitimate real-time processing, the Sun have merged the motion-capture power of SIMI with both ShotTracker and Noah to put a new combined data set in the hands of coaches.” (Newcomb, 2020) Through this technology they can track anything from ankle flex, to how square their shoulders are, to even how fatigued the players have become to lower risk of exhaustion. The increase of the technologies have helped both the offensive side and the defensive side of things as players can see what they are doing wrong on both sides of the ball. However, the offensive efficiency side gets a much larger boost as they can now track all the statistics needed to help lower or higher their value on the court.

Efficiency of Rookies and Sophomores

Rookies and sophomores’ efficiency offensively and defensively have had a role to play in this. In 2005 a controversial rule called the “One-and-Done” policy made it so that high school basketball players had to be a year out of high school before they could be eligible for the draft. This meant that they could do whatever whether that be training separately, going to college, and playing basketball, or entering the G-League. Since this rule was instated, it allowed players to gain more experience in larger crowds, higher stake games, and allowed them to mature more as players and people. In the 2003 draft Darko Milicic was selected number two overall and did not play basketball at college and was drafted at the age of 18. Milicic was thrown into the league and had an offensive rating of 69 and a defensive rating of 88. (Basketball Reference, n.d.) While we look at a more comparable player in Jalen Green, who was drafted number two overall in the 2001 draft. Green had an offensive rating of 105 and a

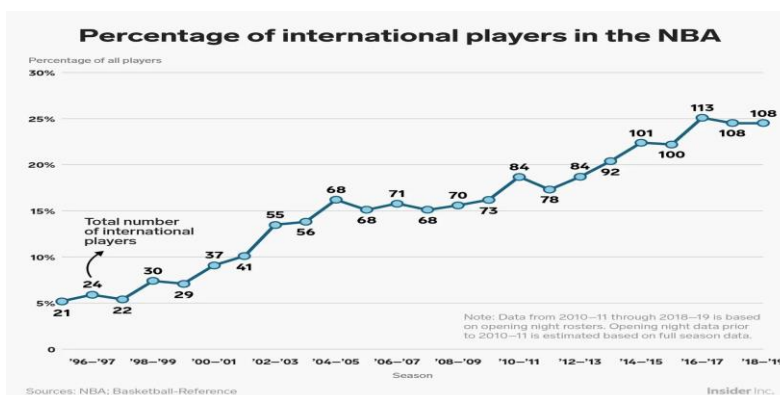
defensive rating of 120. (Basketball Reference, n.d.) Green did this after spending a year out of high school playing in the G-League in preparation for the NBA. The average offensive ratings as of a study done in 2017 are 98 and a defensive rating of 105.

(Prieto) As numbers in ratings have begun to rise since the rule was established that players need to spend a year out of college, we are beginning to see a rise in both the overall defensive and offensive efficiency in younger careers. This shows that we can only expect more growth in the future.

European Players

Although the National Basketball Association is based in the United States, it doesn't prevent players from foreign countries coming to compete. Since the 1990's there has been a significant increase in European players that have competed in the NBA over the years. There has been a 20% increase in Europeans in the NBA since 1996. (Cash, n.d.) The rise of European players can be seen on Table 1.

Table 1. Rise of European basketball players in the National Basketball Association



This trend is something that NBA teams have begun to pick up on as we see that “the No. 1 NBA draft pick has been foreign born in five of the last nine years.” (Cash, n.d.) Giannis Antetokounmpo (Offensive efficiency: 124, Defensive efficiency: 106), Nikola Jokic (Offensive efficiency: 126, Defensive efficiency: 105), and Luka Doncic

(Offensive efficiency: 110, Defensive efficiency: 107) have all been prime examples of some of the foreign players that have highered the standard recently.

Containing the Offense

The NBA is entering the third wave of an offensive revolution, so what does this mean for defense in the NBA? The increase of the 3pt shot has started to open up extra space which means there is more ground to cover and more options to take care of. The recent changing of rules taking away illegal defense, adding a defensive 3 seconds, and a re-emphasis on hand-checking and body-checking calls has promoted offense and limited defense. Defenses are constantly having to adapt to changes that promote offensive scoring, because that is what draws a crowd to the NBA. So how much has defense really changed? Pace is the number of possessions a game contains per 48 minutes. The average NBA team has close to 13 more possessions per 48 minutes than those of teams two decades ago (Verrier). With those 13 more possessions most result in a scramble on the defensive end due to the pace of play. In addition to all of those factors adding in the advancements of player development, increasing analytics, and an era where excessive physical play is limited, defense is at a much harder spot. As scoring is on the rise it is easy to quickly blame the defense and consider it getting increasingly worse, but to what degree is it the defense's fault. The NBA is pushing for "freedom of movement" which takes away any physical play. Players and teams who take pride in their defense are slowly losing their edge as they are getting called for more and more fouls causing them to have to adapt. The Houston Rockets were being called on average for 4 more fouls per game than last season. They were continuing to be physical, but the changes in officiating caused the edge to be taken off of their efforts

as they had to adapt to limit fouls (Verrier). The NBA is in a new era of scoring in part because of many factors and defense is constantly changing and adapting due to more skill, more fouls, and more space to cover and maintain.

Methods

Participants

In this study the participants are coaches from both the NBA and The G-League including head coaches and assistant coaches. This pool measures up to 150 coaches. There are varying levels of experience among these coaches ranging from first year coaches to some who have over 20 years of experience. The largest concentration of these coaches live along the east coast down through Texas so we will take that into consideration to make sure that any bias would not affect the results.

Procedures

Participants will be requested to fill out a survey that will ask about both offensive and defensive efficiency. Questions will aim to find perceptions on how these statistics have changed overtime as well as what effect they have on each other. After collecting as many of these surveys as possible we will analyze the results for common threads of thought that will allow us to gain knowledge into what some of the different thoughts on the matter may be. These findings along with our literature review and analysis of statistics will provide the answer to the question of how connected offensive and defensive efficiency ratings are.

Ethics

With the intent to have full and honest transparency with the surveys each recipient will first accept the surveys and agree to participate. This will also include

information on what the recipients will be answering about as well as ensured response privacy and confidentiality for all participants.

Conclusion

The intent of this research was to find how much of a correlation there is between offensive and defensive efficiency over the past twenty years in the NBA. Offensive efficiency is clearly on the rise in the NBA as individuals and teams are breaking records related to scoring. Many factors play a role on why offenses are becoming more efficient than those of teams in the past. One factor is the three point line. Teams are starting to incorporate the three point shot into set plays and even on fast breaks players will stop and pop beyond the arc. The result provided a clear view on how much the three point shot has changed offensive and defensive efficiency. Teams are taking more shots from the three point line in the past couple years than teams in the early 2000's. The teams however, are still maintaining a very similar percentage from three which led to an increase of points. Teams are also more efficient from the free throw line that adds to the offensive efficiency ratings. Defensive efficiency is impacted because more space is created on the court as the three point shot is a threat. The space leads to lanes and can get defenders out of position, which will either lead to a bucket or a foul. While defense looks to be weaker in the current NBA not all attention should be on the defense. With the new era of scoring more fouls are being called and games are less physical, because the NBA is pushing for freedom of movement which prevents solid, physical defense. Technology is on the rise in sports as it has become something that plays a role in every aspect whether it be game or practice. Shot tracker and replay reviews have allowed teams and players to majorly improve their efficiency

on the court and give them higher opportunities to see what is happening and to improve or change the outcomes. There has also been much more maturity in the league since the addition of the One-and-Done rule that gives players that extra year to learn about their game and to groom them for the bigger stage such as the NBA. Thus enhancing their efficiency on both sides of the ball. Much more than just the younger generation is changing the NBA as the European players have had a great role in that. Euro players have begun to take over drafts as well as be heavy favorites for awards such as Most Valuable Player and Defensive Player of the Year Awards. Offensive and defensive efficiency has always been on a scale that affects one another. As there have been many factors that have affected this we have seen that the more the focus is on the offense like it is trending to be the less the defensive efficiency of the NBA as a whole has become.

References

Burrows, C. (2019, October 15). How to calculate a basketball team's offensive and defensive efficiencies. SportsRec. Retrieved January 17, 2023, from <https://www.sportsrec.com/calculate-teams-offensive-defensive-efficiencies-7775395.html>

Cash, M. (n.d.). NBA's trend of increasing number of international players appears to be slowing down. *Business Insider*. Retrieved January 19, 2023, from <https://www.businessinsider.com/growing-number-of-foreign-born-players-in-nba-slows-2018-10>

Freitas, L. (2020). Shot distribution in the nba: did we see when 3-point shots became popular? *German Journal of Exercise and Sport Research : Sportwissenschaft*, 51(2), 237–240. <https://doi.org/10.1007/s12662-020-00690-7>

NBA team free throw %. NBA Stats - NBA Team Free Throw % | TeamRankings.com. (n.d.). Retrieved January 19, 2023, from <https://www.teamrankings.com/nba/stat/free-throw-pct?date=2022-06-17>

NBA Team Three Point %. NBA Stats - NBA Team Three Point % | TeamRankings.com. (n.d.). Retrieved January 19, 2023, from <https://www.teamrankings.com/nba/stat/three-point-pct?date=2022-06-17>

Newcomb, T. (2020, November 18). *Phoenix Suns unveil a practice facility using technology in a way no NBA team has before*. Forbes. Retrieved January 24, 2023,

from <https://www.forbes.com/sites/timnewcomb/2020/11/18/phoenix-suns-unveil-nba-first-technologically-advanced-practice-facility-owner-calls-it-special/?sh=6eb462fc6273>

Prieto, J. (2017). *Differences between offensive and defensive ratings of rookies and sophomores in the nba basketball league. Cuadernos De Psicología Del Deporte, 17(3), 157–162.*

Staff, T. A. N. B. A. (n.d.). *NBA's scoring explosion: What's happening, can it continue and will anyone score 82 (or more)? The Athletic. Retrieved January 19, 2023, from <https://theathletic.com/4063884/2023/01/06/nbas-scoring-explosion/>*

Verrier, J. (2018, October 30). *You can't stop NBA offenses-and now, you can't even hope to contain them. The Ringer. Retrieved January 24, 2023, from <https://www.theringer.com/nba/2018/10/30/18038802/nba-defense-offensive-boom>*

2003-04 NBA player stats: Per 100 possessions. Basketball. (n.d.). Retrieved January 19, 2023, from https://www.basketball-reference.com/leagues/NBA_2004_per_poss.html