

# AN ANALYSIS ON THE TRENDS OF THE THREE-POINT SHOT IN THE NATIONAL BASKETBALL ASSOCIATION

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## I. BIG DATA PROBLEM

Given NBA players' stats per season, how do we determine how many 3-point shots are attempted per season as compared to total shots attempted? With that, we aim to see the change in behavior in terms of NBA league's shot selection on a season-to-season basis. Results will be visualized in a histogram.

## II. DESCRIPTION OF SOURCE DATASET

The dataset is taken from Kaggle (<https://www.kaggle.com/drgilermo/nba-players-stats>).

With regards to the description of the dataset, it is the complete dataset of every single player that has played on every single team for every year since the inception of the NBA in the 1950s.

The dataset contains columns such as: the year, the player name, their position, their age, their current team, their player-efficiency-rating, among many other statistics. However, the group will focus mainly on the following: the teams, the years, the **total** field goal attempts, and **total** three-point field goal attempts.

## III. ANALYSIS AND ASSESSMENT

### Description of the Output

For the analysis of the data, we elected to use the following:

- 1) Line graph of total field goal attempt and total three-point shot attempts by team
- 2) Bar chart of total field goal attempts vs three-point attempts for the entire NBA league

### Explanation and Discussion

From the data regarding frequency, we see that there are significant drops in terms of both total field goal attempts and three point attempts, specifically in the years 2011-2012 and 1998-1999. The explanation for these drop in attempts (both total and three-point) is that during these two seasons, the NBA had experienced a lockout, wherein if team owners and players fail to come to an agreement about payment conditions in the league. The aforementioned lockouts are only two out of the four historical NBA Lockouts, but the other two have no significant effect on the frequency of the total field goal attempts because they did not result in shortened NBA seasons, as the lockouts were resolved before the NBA season started. The two lockouts mentioned (1998-1999 and 2011-2012) resulted in shortened seasons for the league, with the 1998-1999 and 2011-2012 seasons having 50 and 66 games out of 82 games, respectively. This significantly affects the total number of attempts that the league has, first: because there are a total of 30 NBA teams that play 82 games a year. If 16 games are missed, that will significantly affect the number of attempts that are taken every year.

Another spike we see is the number of three point attempts in the years 1995-1998. From our research, it shows that in 1995, the league shortened the three-point line from 23'9"

at the top of the key and 22' in the corners, to 22' all the around. This was due to a league-driven initiative to increase scoring in the league. Because of this, three-point shots were now closer to the basket than before. This resulted in a spark in total three-point attempts. However, in 1998, line was moved back to the original length, and the attempts normalized.

With regards to the total number of field goal attempts, it has been steadily rising, with more teams being added to the NBA. Initially, in 1950, the NBA only had 17 teams, but now, in 2017, we have 30 different NBA teams. This contributes heavily to the total number of field goal attempts per season.

With all that said, overall, we see a trend that the three-point shot is increasing in frequency through the years. The three-point-attempt to total-field goal attempt has been steadily rising as the NBA continues to evolve in terms of its game. From having no three-point attempts from 1950s to 1970s to the introduction of the three-point shot in the 1979-1980 season. Back then, the players thought of it as a gimmick, but now, it is almost an essential part of the game, with the current ratio of three-point-attempts over total field goal attempts reaching more or less 30%. The behavior of each team varies very minutely, as NBA players are always subject to moving teams due to contracts, trades, etc. **That being said, the percent shots attempt as threes (three-point-shot-attempts over total field goal attempts) is steadily increasing.**

#### IV. OUTPUT VISUALIZATION







