Project Part 3

Arjun Ganesh

Question

The ever longing question when looking at the best NBA player is what makes them so special? Why is everyone talking about them? It boils down to one of two things: are they good on the offensive side or defensive side of the game? Given this very unique 538 statistic, is a player's performance better on offense versus defense given their individual raptor offense and defense values?

Data Description

The data was made by 538.com is a website used to opinion polls, politics, economics, and sports blogging using statistical analysis. This data is constantly updated and shows very cleanly who the best NBA player is. Their metric on identifying the best players is using their "Raptor" value. Raptor is a plus-minus statistic that measures the number of points a player contributes to his team's offense and defense per 100 possessions, relative to a league-average player.

However, in part 1 the original csv file lacked some prominent player names, so I found another csv that they had posted that lined up with the current season.The data collected is from a population of the NBA's advanced statistics website in which they are even more categories to categorize the players. From there, they created the "Raptor" metric and sampled from the NBA, only players with at least 1,000 minutes played in a season since 2013-14. Some other notable statistics in the data set include W.A.R. value (Wins Above Replacement), the raptor offensive and defensive individual values.

What Test Should We Use?

From the dataset, each row has an individual player's statistic. So the data is dependent in that sense. By comparing their offensive and defensive raptor values I have to use a paired t-test. This is a special case of the simple one sample t-test as we have to compare difference of the offensive raptor and defensive raptor value of each player. The same assumption is required and we can see below the difference of the paired values are normally distributed as well. The individual columns were also normally distributed as well as their qqplot. Now we may conduct our test!

H0: The mean difference between the two raptor statistics is 0. HA: The mean difference between the two raptor statistics is NOT 0.

```
#checked for normality
offense <-latest_RAPTOR_by_player$raptor_offense
defense<-latest_RAPTOR_by_player$raptor_defense
diff<-(offense-defense)
hist(diff)
```

Histogram of diff
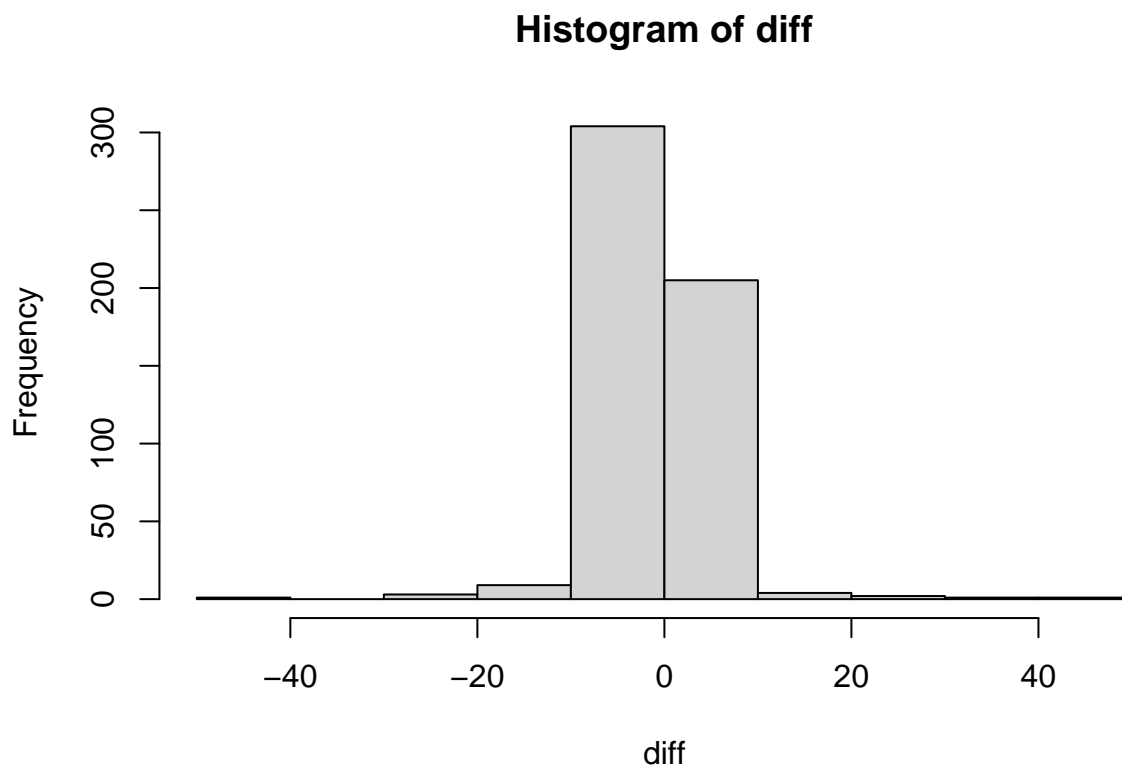
```
## Conduct the hypothesis test
t.test(offense, defense, mu=0, alternative="two.sided", paired=TRUE)$p.value
```

```
## [1] 0.0002869514
```

Statistical Conclusion

From our paired t-test, we got a p-value of 0.000287 and that is less than our alpha value of 0.05. We will reject our null hypothesis to say there significant evidence that offense raptor score is more impactful than the defensive score.

Non Statistical Conclusion

We conclude that The offensive raptor metric has more of an emphasis towards the raptor total than the defensive raptor metric. The raptor metric in general is a good statistic to look if we want to discuss who the best NBA player is.

We can generalize that having a higher offense skill rating is also important to the games played as the overall 2020 season was cut short and the tournament style games to conclude the season showed that a lot of more points were scored than the previous season. In terms of the individual player, the NBA teams of the 90s were known to prioritize defense over offense. That has quickly changed since the recent entering of Steph Curry and other dynamic 3 point shooters to help their teams score more to win. Steph Curry, James Harden, and others are included in the higher end of overall raptor scale and the offensive raptor scale. I think moving forward players will try to improve their offensive skills as the 2020 season has shown. It would increase their personal value to the team. Some further steps for post analysis are to look at pace impact and points scored as that would shed light on the offensive impact in terms of how many points need to be scored.

References

1.https://github.com/fivethirtyeight/data/tree/master/nba-raptor.

2.https://www.datamentor.io/r-programming/histogram/.