

The trades the General Manager conducted helped the Boston Celtics succeed

Celtics latter season 2022-win streak - how did it happen & who were the high value players?

Stephen Cassata¹
@StephenCassata
scassata@umass.edu

¹ Undergraduate, College of Computer Science, University of Massachusetts Amherst

Introduction

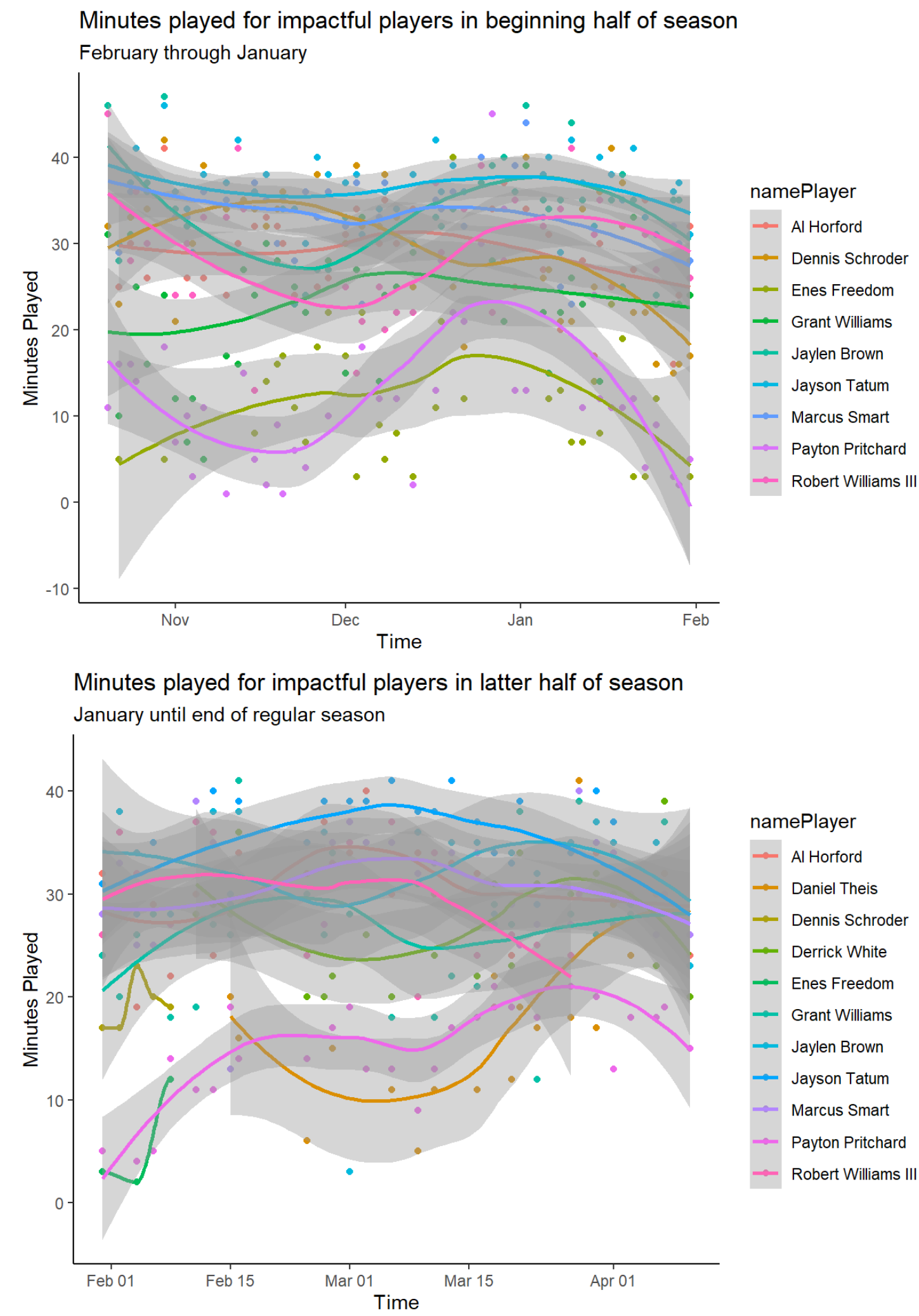
This paper aims to provide an analysis of my personal favorite NBA team: the Boston Celtics. Specifically, I will be analyzing the 2021-2022 NBA season particular. I selected this season to analyze because it was a standout season for the Boston Celtics. At the start of the regular season, the Celtics were having some trouble finding their groove, they were a mediocre team up until the end of January. At this point, they had an average record of 27 wins to 25 losses. Celtics fans were upset at the performance they were putting on with a Reddit user at the beginning of December creating a post titled “How does a team regress so far while having 2 ascending stars.” This post got 326 upvotes displaying the frustration from the Celtics fanbase. It was believed they were not living up to their potential. However, everything changed when the month of February started. Celtics finally started to display they were a top-tier team. They kicked off the month with a nine-game win streak and played terrifically from then until the end of the season, ending with a record of 51 wins to 31 losses, putting them second in the standings for the eastern conference. Displaying they **only lost** 6 games from February until the end of the season.

Given this information, I thought it would be fun and interesting to try to uncover what happened at the beginning of the Celtics’ 2021-2022 season & compare that to what happened in the latter half of the season. I’d like to find out what changes in the game plan occurred at the beginning vs the latter half of the season and determine the high-value players that assisted in the Celtics’ execution.

Methods & Data Collection

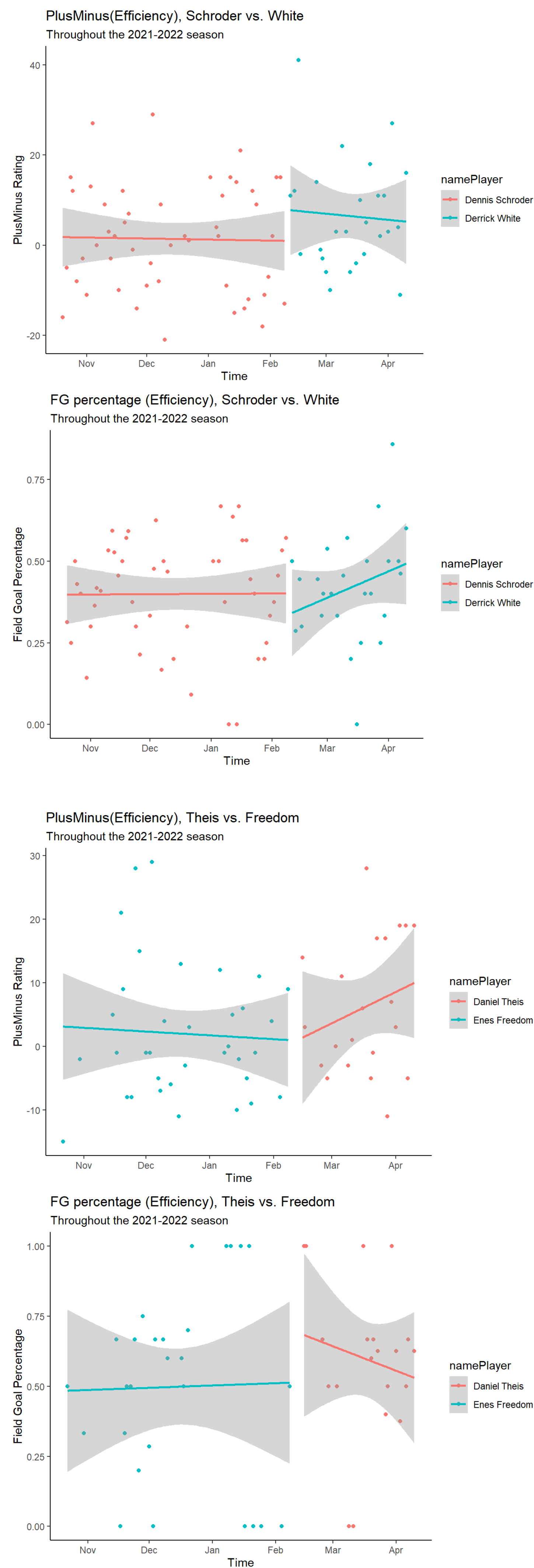
I downloaded an R Package called “nbastatR” from GitHub. It is often used in NBA analysis. This package came with several commands to gather data and I came across the game_logs() command which gathers all game data for a specified season. I filtered(using the filter() function) through this large dataset I was given and made several data frames that only contain Boston Celtics data. I began my analysis by comparing the minutes allotted to players during the beginning of the season versus the minutes allotted to players in the latter half of the season. I noticed the minute allocation changed quite a lot due to recent trades which sparked the idea of comparing the players we traded away to the players we traded for. I compared their efficiency through two metrics: their PlusMinus statistic as well as their field goal percentage statistic. Further, I wanted to determine the differences in the game plan for the beginning half of the season compared to the latter half of the season. Therefore, I garnered total team data & constructed linear probability models on the independent variable “isWin” to determine the significance of three dependent variables being free throws attempted, three-point field goals attempted, and two-point field goals attempted. I did this for both the beginning of the season data as well as the latter half of the season data and compared and contrasted.

Results



These graphs above display the minute allocation for the beginning half of the season and the latter half of the season. We can see that Dennis Schroder & Enes Freedom got traded so there lines cut off around February 8th. Two new players are added in, Derrick White and Daniel Theis.

Given that these players were added lets compare their efficiency to their counterparts.



We can see from these graphs above that the players we traded for clearly play more efficiently than the players we traded away. This explains a positive change that was implemented that helped the celtics win more games in the latter half of the season. Derrick White and Daniel Theis were large factors.

Further, I wanted to explore the shots players were attempting to see if this would explain the differences in coaching incentives from the beginning of the season

compared to the latter half.

```
## Acquiring NBA basic team game logs for the 2021-22 Regular Season

## [1] "0" "1"

## FALSE TRUE
##      0    1
```

Table 1: Estimtes for if the celtics win or lose in the BEGINNING HALF of the season, regressed on free throws attempted, 3-pointers attempted and 2-point field goals attempted

term	estimate	std.error	statistic	p.value
(Intercept)	3.1203718	3.4187803	0.9127149	0.3613925
fTaTeam	0.0041035	0.0439570	0.0933517	0.9256242
fg3aTeam	-0.0275968	0.0452424	-0.6099773	0.5418768
fg2aTeam	-0.0415406	0.0386197	-1.0756310	0.2820923

Table 1: Estimtes for if the celtics win or lose in the LATTER HALF of the season, regressed on free throws attempted, 3-pointers attempted and 2-point field goals attempted

term	estimate	std.error	statistic	p.value
(Intercept)	2.9470511	8.0717964	0.3651047	0.7150332
fTaTeam	-0.0104506	0.0687764	-0.1519509	0.8792256
fg3aTeam	-0.0563586	0.1105741	-0.5096909	0.6102680
fg2aTeam	0.0187128	0.0922845	0.2027726	0.8393128

It is important to go over what these variables. isWin is a variable with two factors “0” meaning lose, and “1” meaning win. fTaTeam means the number of team free throws attempted per given game. fg3aTeam means trhe number of three-pointers attempted per given game. fg2aTeam means the number of 2-pointers attempted per given game(either layups or mid range shots).

When attempting this I thought I would be able to figure out what shots attempted would work best in the beginng half of the season versus the latter half. However, these results did not come out as I expected. None of the results are statistically significant and it’s hard to come to a conclusion with these LM’s.

Assuming the results would be significant we can see for fg2aTeam is much higher in the latter half of the seasons lm at 0.0187128. This would mean the amount of 2-pointers attempted greatly positively affected the probability of winning in the latter half of the season.

In the beginning half of the season the only way the celtics were finding success was through free throws attempted. The more they got to the line the higher probability of winning. Each free throw attempted would increase the probability of winning by 0.0041035.

Discussion

Starting with the minutes graph that we observed, we noticed in the beginning half of the season Dennis Schroder was taking up a great deal of minutes from other players. This was determined to be unsuccessful by looking at the Celtics’ record. When Derrick White came in, he began to take over Dennis Schroders’ minute allocation. The same thing happened with Daniel Theis and Enes Freedom. This can be determined as successful when we look at the PlusMinus & Field Goal Visualization that were created. The graphs display a significant increase in performance when comparing who we traded.

References

- nbastatR
- GitHub