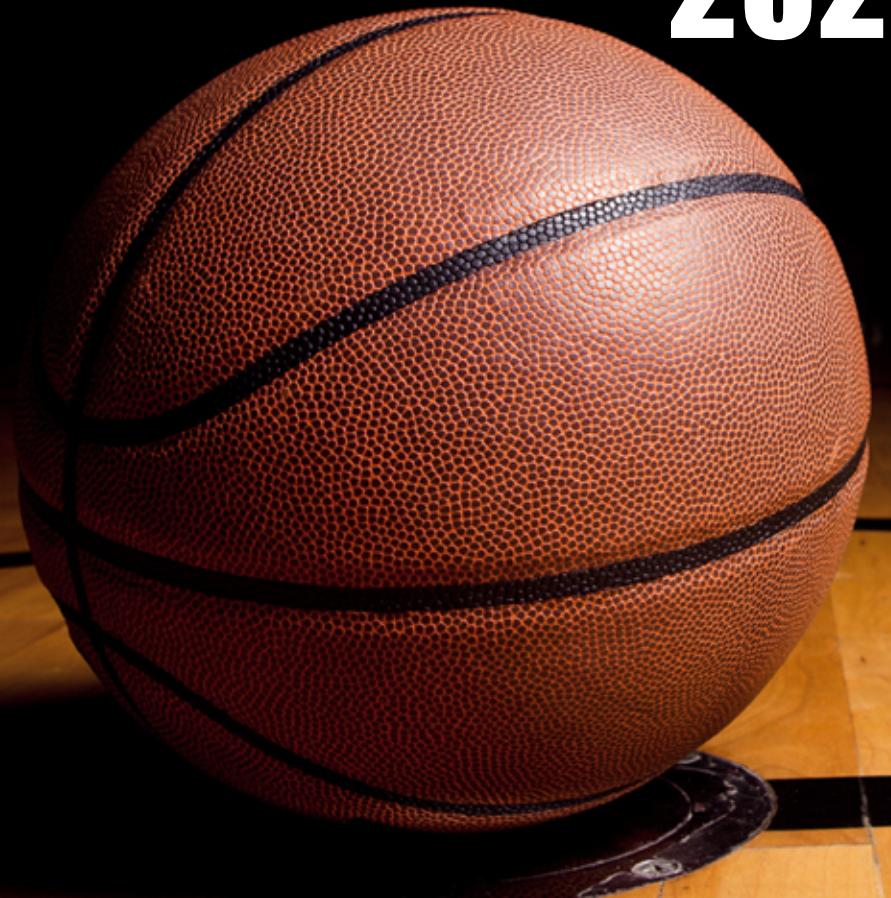


Predicting Player's Three Point Percentage of 2022-2023 NBA season

By: Abel Lula



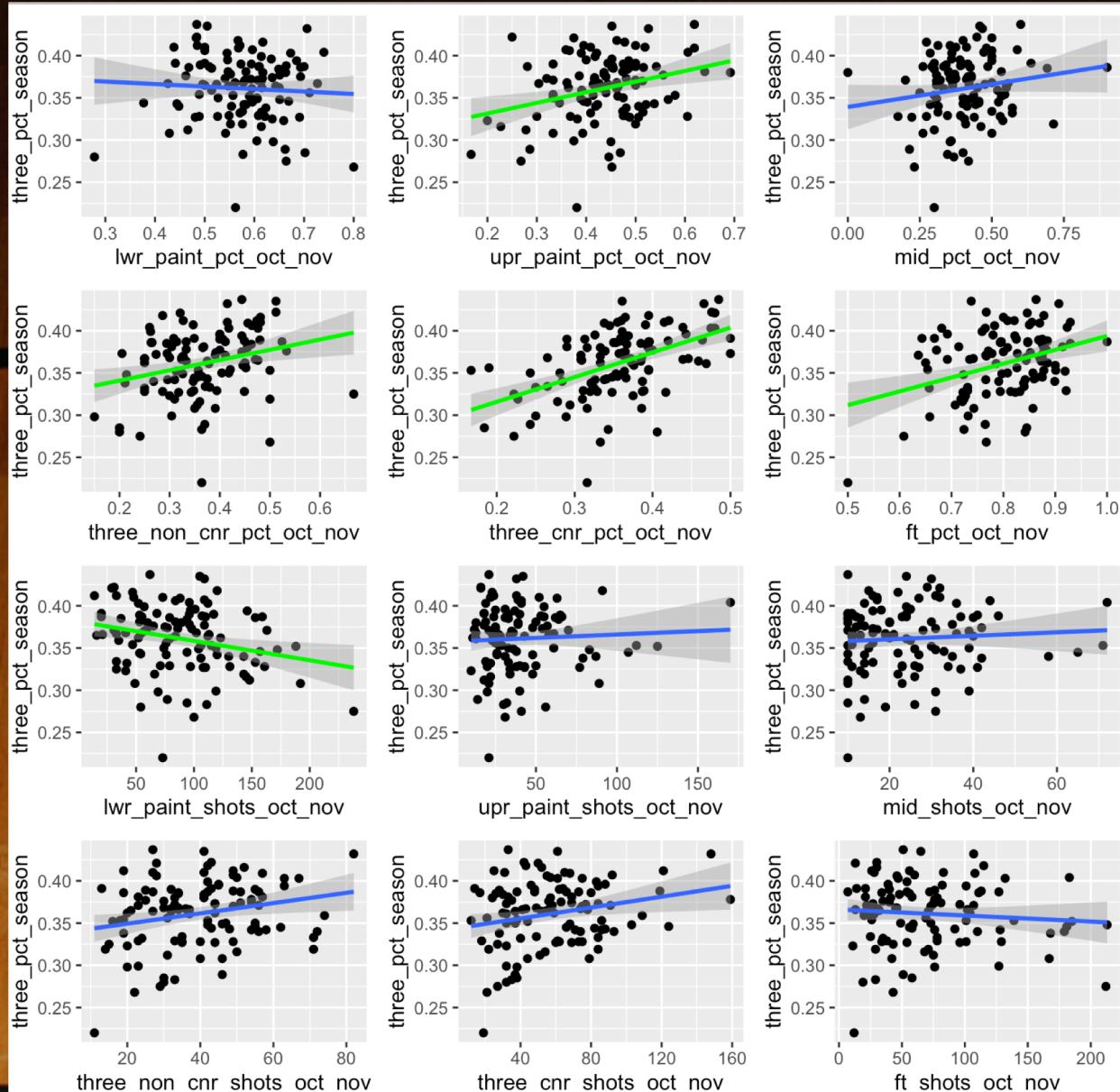
Methodology

- These scatterplots show whether or not each predictor has a linear relationship with the Season 3pt%, which can determine which predictors have the most effect on 3pt%

Conclusion

- The scatterplots that have a predictor about a percentage seems to be more correlated to to the Season 3pt% than a predictor about shot attempts.

Scatterplot of All Variables Compared to Season 3pt %



Model Used:
Multiple Linear Regression
With Smooth Spline

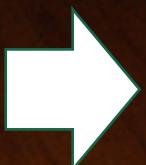
Legend

	High Correlation
	Other

In order to reduce the amount of predictors in the model, stepwise regression finds the best model by either adding or dropping a predictor at each step based on some criteria.



Using backward selection and using BIC as the criterion, the best subset model happens to remove 9 predictors and left these 3 predictors to be the most important:



This means that in October and November, the three best variables to determine an NBA player's 3pt percentage on the season was Corner 3pt Percentage, Non Corner 3pt Percentage, and Free Throw Percentage.

Prediction Accuracy Metric: Mean Squared Error (MSE)

- MSE is a good accuracy metric because the difference between each prediction and the actual value is squared.

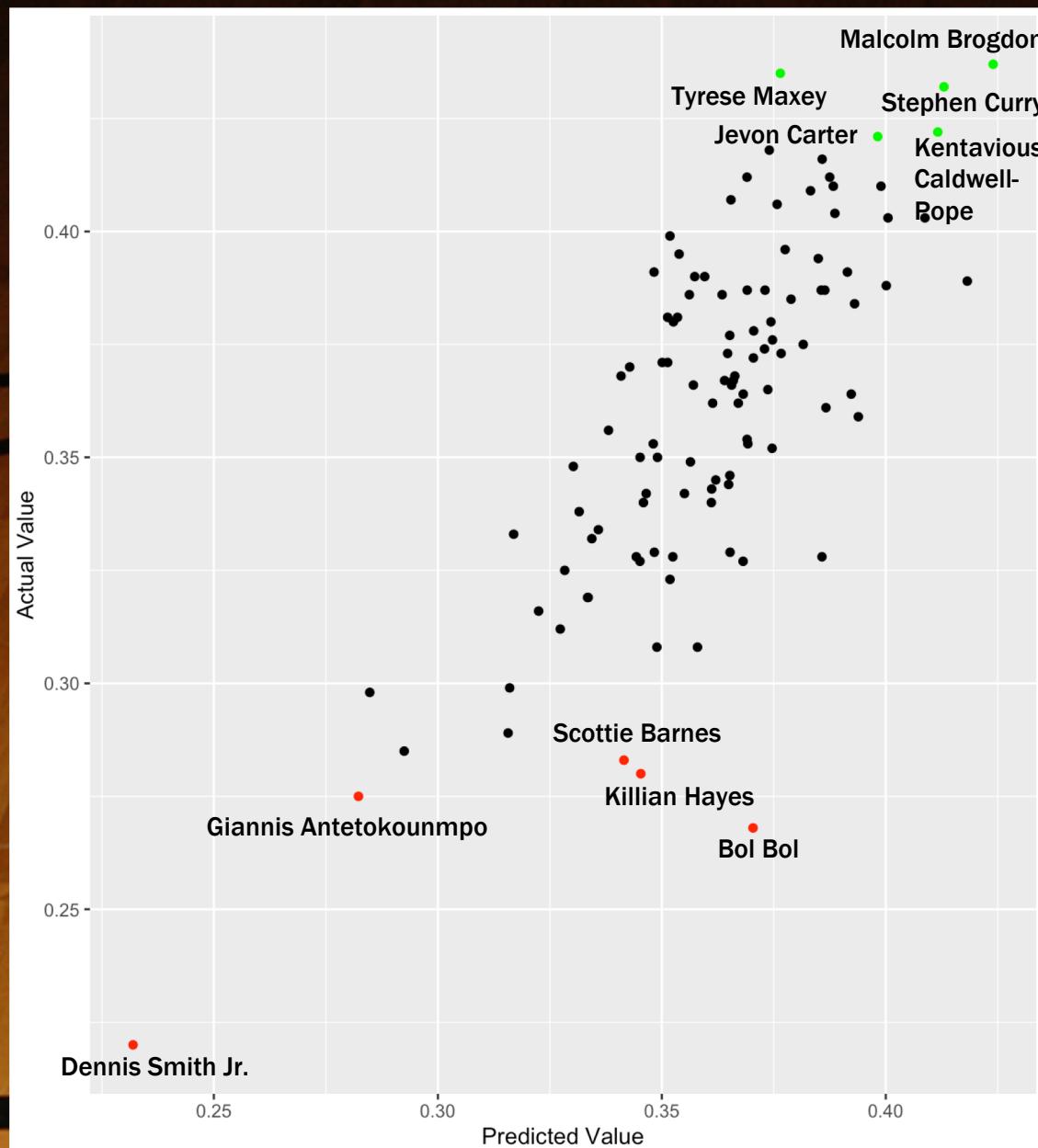
$$\text{MSE} = \frac{1}{n} \sum_{i=1}^n (Y_i - \hat{Y}_i)^2$$

MSE of Full Model
0.0007393868

MSE of Reduced Model:
0.0006531476

Conclusion:
Reduced Model has lower MSE and is less complex than full model.

Predicted vs Actual 3pt %



Analysis on 3 Point Shooters

Predicted Top 5

1. Malcolm Brogdon
2. Brandon Ingram
3. Stephen Curry
4. Kentavious Caldwell-Pope
5. Jerami Grant

Actual Top 5

1. Malcolm Brogdon
2. Tyrese Maxey
3. Stephen Curry
4. Kentavious Caldwell-Pope
5. Jevon Carter

Notes: Maxey's low free throw percentage of 73.6% most likely explains why the predicted value is not even top 20.

Predicted Bottom 5

1. Dennis Smith Jr.
2. Giannis Antetokounmpo
3. John Wall
4. John Collins
5. Jalen Smith

Actual Bottom 5

1. Dennis Smith Jr.
2. Bol Bol
3. Giannis Antetokounmpo
4. Killian Hayes
5. Scottie Barnes

Notes: Bol 's high non corner 3pt percentage of 50% explains why the predicted value was massively spiked up.