When looking at a data, I believe the following are the top stats that a basketball fan or NBA executive would be interested in:

***1) Rebounding Margin/Offensive Rebounds***

Team A grabs 48 total rebounds, including 15 offensive rebounds.

Team B grabs 32 total rebounds, including 12 offensive rebounds.

Team A was able to catch 60 percent of the 80 total missed shots, giving them 15 more chances than their opponents. Simply by rebounding successfully, Team A gained three possessions over Team B. Consider how many close games you've won and lost as a player in which three additional possessions for you or your opponent could have tilted the game in your favor.

***2) Differential in free throws***

In our data, free throws are a significant factor. It has the potential to offer more information about the game. As a result, the average foul line goal for a club is around 70%. The attempt column can be used to assess a team's offensive and defensive aggressiveness.

Although officials play a role, the attacking squad that is more aggressive is more likely to get to the line. You can assess which team is more active in terms of attacking the basket and getting the ball inside by comparing three-point attempts to free throw attempts.

***3) Assists on Field Goals %***

This is a metric that measures how successfully your team transfers the ball and locates open players. Also, how well they collaborate as a group.

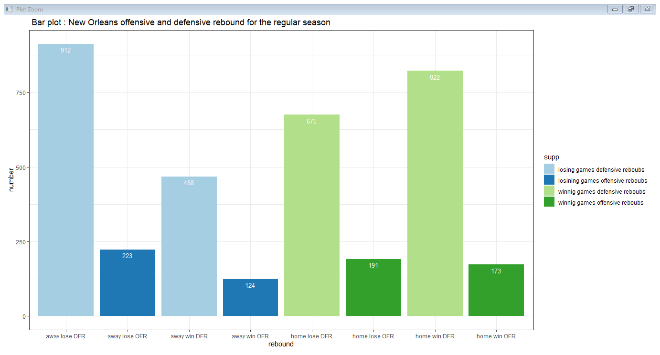
According to the official NBA stat, anything over 50% (number of assists over number of field goals made) is good, but we should aim for 65 percent or better in this category. If your team scores less than 50% in this category, there's a considerable possibility a player like James LeBron will play a significant amount of minutes for you.

***4) Turnover Differential/Assist-To-Turnover Ratio***

The assist to turnover ratio is one of many basketball statistics that can be used to assess a player's ball control and handling abilities. It's calculated by dividing a team's total number of assists by the number of turnovers they've committed in the same game. At least a 2:1 ratio is a decent target for a team to aim towards. To put it another way, if your team has ten turnovers, you should have at least 20 assists.

If your team has twice as many assists as turnovers, they are considerably more likely to move the ball and get good shots than they are to throw the ball away. In basketball, the best teams, such as Golden State, and point guards, usually succeed.

New Orleans played 82 games in the regular season, they win 34 games, and they lose 48 games, with a low percentage of winning 41.46. from the 34-win games they win 21 of them were in at home and only 13 wins away, with a percentage of 38.24 winning away. Moreover, they lose 20 games at home and 28 away with a losing rate of 58.33 when they play away. Using a z-test we can see that it is statistically significant that New Orleans win more games at home than away meaning that the play well at home more than outside. In contrast there is no significant for the losing games, in other words there is no deference if New Orleans plays at home or away for the losing games.

In the regular season New Orleans make a total of 3588 rebounds, 711 (20%) of them were offensive rebounds and 2877 were defensive (80 %). For the home winning games in the regular season New Orleans made 995 rebounds ,82.26% of them were defensive rebounds. away games they make a total of 592 rebounds in the whole regular season, 79.31% were defensive rebounds. When it comes to losing games, New Orleans make 2001 rebound 56.72 % of them were defensive rebounds in both away and home losing games. 

New Orleans make a total of 1869 assists in the regular season 816 in the winning games and 1053 in the losing games. however, when they play at home, they make 16.64 % more assists than when they play away. meaning that they move the ball and finds the open player well at home than away. The assist on field goal for New Orleans is 58.22 which is not a good percentage for a team who wants to compete for the NBA championship.

New Orleans assist/turnover ratio for the regular season is 1.85.in the winning games they have a ratio of 2.08 with 2.14 ratio in the home games and 1.99 in away winning games. For the losing games New Orleans has a ratio of 1.70. however, in the home losing game they have a ratio of 2.36 compared to 1.25 ratio in away losing games.

***Conclusion :***

Based on this we can say that in home winning games New Orleans has a good defense with 82.26% defensive rebound also they have a good control of the ball based on the turnover ratio 2.08. moreover, they are more discipline and less aggressive since the total of 3 points attempts is bigger than the free throw attempts. In the other hand, in the losing games New Orleans makes only 20% offensive rebound meaning that they have an issue when they attack. Also, they have a turnover of 1.7 for all losing games which a very low ratio meaning that they lose the ball too often

It is true that they have a good defensive, but they cannot win with this weak attack. Defense is important but not everything as they say the best way to defend is to attack. New Orleans need to purchase a good attack player next season.

We want to fit a Multiple linear regression model in order to predict the score of a team based on our variables. First, we change the class of some variables form numerical to factor, starting with home which has two levels 1 = the team is playing at home, 0 = the team is playing away. Then we change game type to factor with two levels as well 1= for regular season and 2 for playoff. Finally, we modify Min to factor having 4 levels 48 =1, 53=2 , 58 = 3 , 68=4.Then ,we fit a multiple linear regression including all the variables, we see that there a multicollinearity among the variables based on Variance Inflation Factors (VIF) ,such as the field goal 3 point made (fg3m) and attempt (fg3a) , rebound , free throw… etc. Therefore, we decided to Linearly combine the independent variables, by dividing them to make percentages which will give us new variables to predict the model such as percentagefor3piont, pecentagefor2point …etc. Next, we perform a stepwise selection model in order to choose the significant variables for our model.

The step wise selection gives a model with 20 variables that will estimate the team score based on the assists ,percentage of 2 points, percentage of 3 points , opponent personal fouls , offensive rebound , defensive rebound , percentage of free throw , number of turnovers , number on minutes played , opponent blokes , opponent defensive rebound , opponent assists , personal fouls ,number of stealing the ball , opponent percentage of free throw , opponent percentage for 2 point , opponent percentage for 3 points , opponent turnovers, number of , blocks and finally number of opponents stealing the ball.(TeamScr = Ast + pecentagefor2point + percentagefor3piont + Pf.1 + Oreb + Dreb.1 + percentafreethrow + To + Min + Blk.1 + Dreb + Ast.1 + Pf + Stl +opponentfreethrowpercentage + percentagrforoppnent2point +percentagrforoppnent3point + To.1 + Blk + Stl.1)

Using the given model to predict the score of golden state and Cleveland in the 5 playoff games.

***Golden state playoff prediction table:***

|  |  |  |  |
| --- | --- | --- | --- |
| Game number | team | Predicted score | Real score |
| 1 | Golden state | 143.47 | 113 |
| 2 | Golden state | 111.68 | 132 |
| 3 | Golden state | 96.09 | 118 |
| 4 | Golden state | 121.84 | 126 |
| 5 | Golden state | 104.06 | 129 |

***Cleveland playoff prediction table:***

|  |  |  |  |
| --- | --- | --- | --- |
| Game number | team | Predicted score | Real score |
| 1 | Cleveland | 118.56 | 91 |
| 2 | Cleveland | 119.67 | 113 |
| 3 | Cleveland | 128.68 | 113 |
| 4 | Cleveland | 119.38 | 137 |
| 5 | Cleveland | 111.73 | 120 |

Both teams got improved between the regular season and the playoff, for a percentage of 78.44 % defensive rebound for golden state in the regular season while in the playoff they have a percentage of 79.70 %. Using a t-test we can that it is statistically significant that the assists went up in the playoffs comparing to the regular season, meaning that the team harmony grow. Cleveland, improved as well in the playoffs compared to the regular season. Based on the t-test we can say that it is statistically significant that Cleveland turnovers decreased in the playoff meaning that the players concentration went up since they don’t lose the ball very often compared to the regular season.