Introduction:

The study showcases how the LINEST function from Microsoft Excel can be utilised to predict Regular Season Team Winning Percentage in the NBA, based on historical annual team records and statistics.

To enhance accuracy, this study incorporates records from 7 NBA regular seasons, spanning from 2013-2014 to 2019-2020. The data was retrieved from the link below that provides comprehensive statistics and history for every NBA team.

[Basketball Statistics & History of Every Team & NBA and WNBA Players | Basketball-Reference.com](https://www.basketball-reference.com/)

For each team per season, the following records were extracted: Winning Percentage, Field Goal Made (FGM), Field Goal Attempt(FGA), Field Goal Percentage(FGpct), 3pts Made(3PM), 3Pts Attempt(3PA), 3pts Percentage (3Ppct), Free Throw Made(FTM), Free Throw Attempt(FTA), Free Throw Percentage(FTpct), Points(PTS), Rebounds(REB), Off. Rebounds(OREB), Def. Rebounds(DREB), Assists(AST), Steals(STL), Blocks(BLK), Turnover(TO) and Personal Fouls(PF).

The database was compiled in excel, defining:

y as Winning Percentage

x variables as Field Goal Made, Field Goal Attempt, Field Goal Percentage, 3pts Made, 3Pts Attempt, 3pts Percentage, Free Throw Made, Free Throw Attempt, Free Throw Percentage, Points, Rebounds, Off. Rebounds, Def. Rebounds, Assists, Steals, Blocks, Turnover and Personal Fouls.

The LINEST Function was used with a goal to find the R squared value, coefficients for each x variable and their respective standard errors, forming a fitted regression model of winning percentage as follows,

y\_prediction = b0+b1\*x1+b2\*x2+…+b17\*x17

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | TO | BLK | STL | AST | REB | PTS | DREB | OREB | FTpct |
| coeff. | -0.06 | 0.00 | 0.07 | 0.01 | 0.06 | 0.01 | 0.00 | 0.02 | 0.05 |
| std.error | 0.00 | 0.01 | 0.01 | 0.00 | 0.00 | 0.05 | 0.00 | 0.01 | 1.60 |
| r-squared | 0.83 | 0.07 |  |  |  |  |  |  |  |
|  | 63.93 | 194.00 |  |  |  |  |  |  |  |
|  | 4.06 | 0.82 |  |  |  |  |  |  |  |
| t-statistic | -12.15 | -0.07 | 10.01 | 1.76 | 13.29 | 0.10 |  | 2.94 | 0.03 |
|  | Significant | Not Sign. | Significant | Not Sign. | Significant | Not Sign. | Not Sign. | Significant | Not Sign. |
| P-value | 0.00 | 0.94 | 0.00 | 0.08 | 0.00 | 0.92 |  | 0.00 | 0.98 |

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | FTA | FTM | 3Ppct | 3PA | 3PM | FGpct | FGA | FGM | Intecept |
| coeff. | -0.02 | 0.02 | 1.90 | 0.02 | -0.03 | 3.10 | -0.05 | 0.00 | -0.68 |
| std.error | 0.05 | 0.09 | 1.50 | 0.02 | 0.09 | 9.11 | 0.05 | 0.00 | 4.28 |
|  |  |  |  |  |  |  |  |  |  |
| t-statistic | -0.46 | 0.23 | 1.26 | 0.91 | -0.35 | 0.34 | -0.94 |  |  |
|  | Not Sign. | Not Sign. | Not Sign. | Not Sign. | Not Sign. | Not Sign. | Not Sign. | Not Sign. | Not Sign. |
| P-value | 0.64 | 0.82 | 0.21 | 0.36 | 0.73 | 0.73 | 0.35 |  | 0.87 |

According to the results, the overall regression was statistically significant (R squared = 0.83), and it was found that Turnover (b=-0.06, p=0.00), Steals (b=0.07, p=0.00), Rebounds (b=0.06, p=0.00), Offensive Rebound (b=0.02, p=0.00) significantly predicted Winning Percentage. Additionally, Assist, 3pts percentage and 3pts made also contributed the prediction despite its t-statistics are slightly less than 2.

Conclusion Remarks:

Despite NBA game changed dramatically the last decade - seemingly emphasizing the need to score more and maintain a faster pace in order to secure victories, this study indicates that Defence (through Rebound, Steals) and minimizing mistake(via reducing Turnover) remain crucial indicators for a team’s success.