

Investigating The Home Court Advantage in The National Basketball Association

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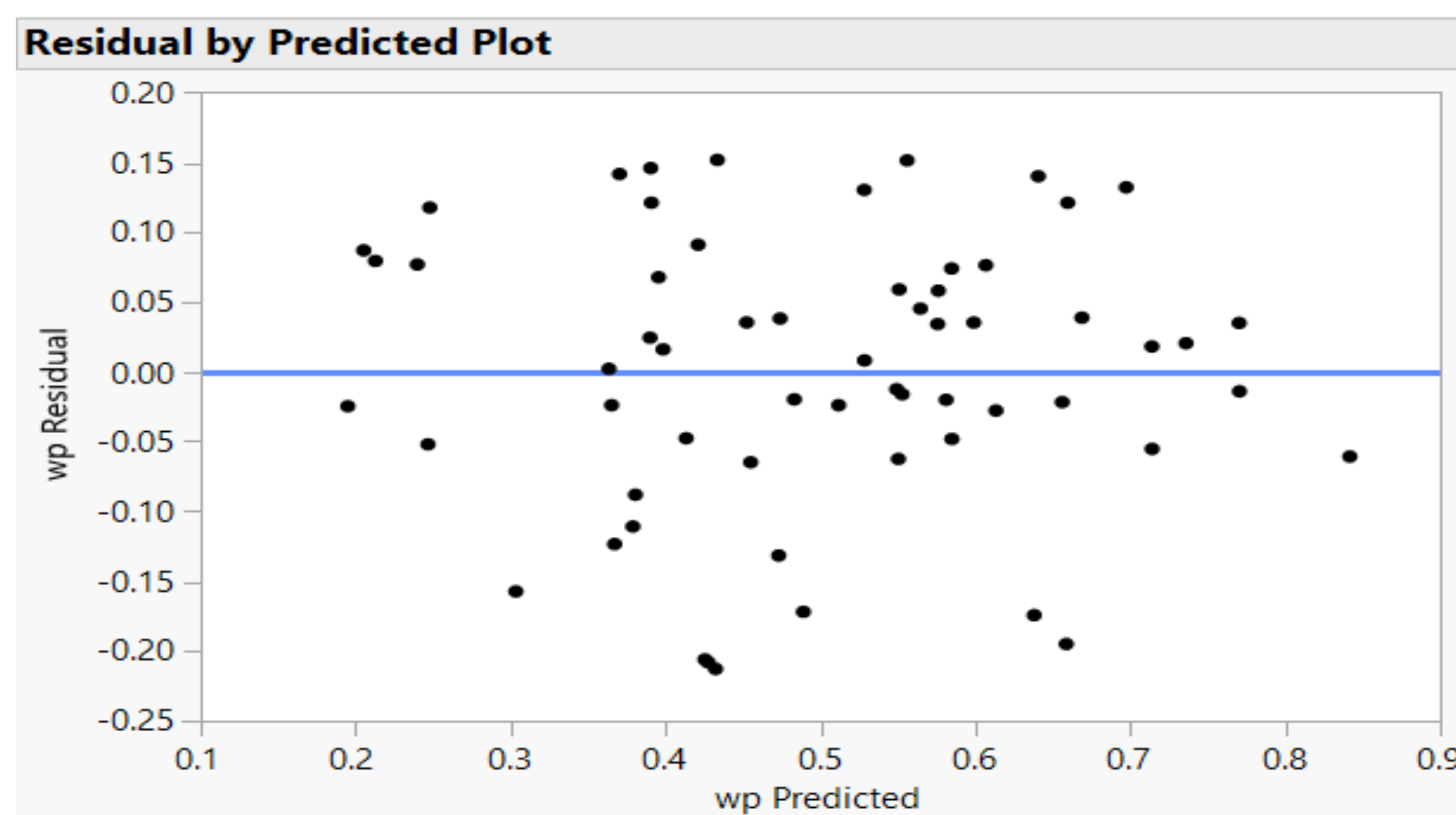


Problem Statement

Does having home court advantage in the NBA affect the probability of winning the game?

Data

- Data collected from BasketballReference.com
- Data used was collected from the 2018-19 NBA regular season and past coaching records for the head coach variables
- wp is the dependent variable
- There are 5 independent variables
- 60 total observations 2 for each team, one for all 41 home games and one for all 41 away game



Analysis of Maximum Likelihood Estimates					
Parameter	Degrees of Freedom	Estimate	Standard Error	t Ratio	Prob > t
Intercept	1	0.1633521	0.052612	3.1	0.0030
home	1	0.0926829	0.013381	6.93	< 0.0001
wins1718	1	0.0059389	0.001507	3.94	0.0002
allstars1819	1	0.1547009	0.027838	5.56	< 0.0001
allstars1718	1	-0.07462	0.020686	-3.61	0.0007
coach_wins	1	0.0000834	0.000051	1.64	0.1078

Least Squares Regression

- Models the expected winning percentage of a team based on the dependent variables, including home and away
- Level of significance is set at 0.15 for a variable to be included in the model was tested using stepwise regression

Summary of dwp	
Min	-0.97561
Q1	0.12195
Avg	0.18537
Q3	0.26829
Max	0.39024

Home vs Road Win %

- dwp is the difference in home winning percentage and road winning percentage for a team in the 2018-19 season
- There were only two teams with dwp less than 0 with the average being 0.18 which shows how important home court advantage is

Conclusions

- The only variable that is not significant at the 5% level is coach_wins
- Home is the most dominant force in determining the outcome of the game
- On average, a team wins 9.27% more games at home than away, holding all other variables constant
- Wins in the previous season only increased the probability of winning by 0.59% per win
- Similarly, All-Stars in the previous season decreased the probability of winning by 7.46% per All-Star on the team
- The data collected previously from the 2018-19 season was rather irrelevant to the probability of winning a game
- The coaching experience variable had almost no effect

Source	LogWorth	PValue
home	8.266	0.00000
allstars1819	6.063	0.00000
wins1718	3.628	0.00024
allstars1718	3.170	0.00068
coach_wins	0.967	0.10783

Future Work

- Because there are two observations for each team, there is a problem of dependence between values
- In the future, a weighted least squares regression could be run for this
- In the future attendance and a variable for loudest arena could be added to capture if the road team faced struggles

Variable Name	Label	Value
wp	Dependent variable that is the observed value of a teams winning percentage for either home or away	Between 0 and 1
home	Binary variable 0 if a team is away and 1 if a team is home for the game	0 or 1
wins1718	Number of total wins a team had in the 2017-18 season	Between 21 and 65
allStars1819	Number of All-Stars a team had from the 2018-19 All-Star team	Between 0 and 3
allStars1718	Number of All-Stars a team had from the 2017-18 All-Star team	Between 0 and 5
coach_wins	Number of career wins a head coach had entering the 2018-19 season	Between 0 and 1197
wph	The winning percentage of a team at home in the 2018-19 regular season	Between 0.2 and 0.9
wpa	The winning percentage of a team not at home in the 2018-19 regular season	Between 0.1 and 0.7
dwp	The difference between wph and wpa	See Summary of dwp