Success Factors in Basketball at the NCAA Men's Division I Level

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INTRODUCTION

- The National Collegiate Athletic Association (NCAA) Division I Men's Tournament
- 68 Teams
 - 32 Automatic Conference Bids
 - 34 At-Large Bids
- Ranked, broken into sections, and compete for the National Championship.
- What makes these teams successful?
- Are there predicting factors of a team's success at this level?

Methods of Research

Data Collection

The last ten years of Final Four teams. 2012-2022

Regression Analysis

The data will be plugged into a regression analysis model to determine factor weights.

Results

Analyze results to understand what these weights mean.

Conclusion

Connect the results to their applications to the game of basketball and their implications.

Factors

Points Per Game Opponents' Points Per Game Rebounds Per Game Opponents' Rebounds Per Game Field Goal Percentage

Three-Point Percentage Assists Per Game Steals Per Game Blocks Per Game Turnovers Per Game

OTHER NOTABLE DETAILS

ARC COMPUTER SOFTWARE

Arc is a computer software that can run the regression analysis to produce results using the given data set.

TRANSFORMATIONS

So they can be analyzed equivocally, each factor has its own unique transformation, which was assigned from the Arc software.

REGRESSION

Several facets of regression play an impact on the analysis of the data.



REGRESSION

MULTIPLE SQUARES LINEAR REGRESSION

This form of regression allows the data to be analyzed in correlation to one another.

In the equation, y represents the success output, x is each factor, and c is their respective weights that contribute to y.

 $y = c_1 x_1 + c_2 x_2 + c_3 x_3 + \dots + c_n x_n$

REGRESSION

PROCESS	CONSEQUENCES			
NORMAL REGRESSION	Each factor's p-value.			
BACKWARD ELIMINATION	Sequentially removed terms based on weight.			
FORWARD SELECTION	Sequentially add terms based on weight.			
IDEAL C _I MODEL	Ideal model of best four predictors.			







Data set = NCAA. Name of Fit = L1 Normal Regression Kernel mean function = Identity = WIN^1.2 Response Terms = (3PP^-0.64 APG^0.93 FGP^-1.9 FTP^-1.49 OPPG^1.1 ORPG^0.46 PPG^0.5 SPG^-1.92 TOPG^2.01) Coefficient Estimates Label Estimate Std. Error t-value p-value Constant 0.873379 0.691445 1.263 0.2163 3PP^-0.64 -0.139554 0.109539 -1.274 0.2124 APG^0.93 -0.0101537 0.00733678 -1.384 0.1766 FGP^-1.9 -0.0556402 0.0311399 -1.787 0.0841 0.0659625 -2.007 FTP^-1.49 -0.132362 0.0539 OPPG^1.1 -0.0110244 0.00159172 -6.926 0.0000 ORPG^0.46 -0.104731 0.0765427 -1.3680.1814 PPG^0.5 0.265517 0.0567145 4.682 0.0001 SPG^-1.92 -0.484271 0.838811 -0.577 0.5680 TOPG^2.01 0.000346766 0.000348591 0.995 0.3278

R Squared:0.865541Sigma hat:0.0410765Number of cases:40Degrees of freedom:30

Summary Analysis of Variance Table Source df SS MS F p-value Regression 9 0.325841 0.0362046 21.46 0.0000 Residual 30 0.0506183 0.00168728

WIN	1,2
TOPG	2.01
SPG V	-1.92
	.5
	.46
OPPG	1,1
PTP V	-1.49
FGP V	-1,9
APG V	.93
3PP	-0.64

♥ Transformations
♥ Case deletions

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NOTABLE RESULTS

IDEAL FACTORS

Opponents' Points Per Game Points Per Game Free Throw Percentage Field Goal Percentage

SURPRISES

Rebounds Per Game

OUTLIERS

Ohio State (2012) Syracuse (2016) Texas Tech (2019)

DEPENDENCY

Clear Relationships Dependent Relationships

CONCLUSIONS

ORIGINAL HYPOTHESIS

- Background/knowledge
- Philosophy
- Strategy
- Recruiting
- Future Implications

TAKEAWAYS

- Correlation rather of factors
- Flexibility for
 - Philosophy
 - Strategy
 - Recruiting
- Future Implications

(چ)

TEAM STATS	\$	٢
FG	19-59	23-53
Field Goal %	32.2	43.4
ЗРТ	6-23	6-17
Three Point %	26.1	35.3
FT	15-20	24-27
Free Throw %	75.0	88.9
Rebounds	34	40
Offensive Rebounds	12	10
Defensive Rebounds	22	30
Assists	7	13
Steals	7	8
Blocks	2	6
Total Turnovers	12	13
Fouls	20	15
Technical Fouls	0	0
Flagrant Fouls	0	0
Largest Lead	4	17

(ESPN 2023)

Applications to 2023 National **Championship?**

