

# Ranking College Basketball Teams: Improving on RPI

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# Background

## Ratings Percentage Index (RPI)

Win Percentage (25%), Strength of Schedule (50%), Opponent's Strength of Schedule (25%)

Widely used by committee to evaluate who should receive at-large bids

# RPI

Widely reviled in basketball community

Too little emphasis on win percentage

Doesn't take into account strength of schedule

No statistical meaning

# ESPN's Basketball Power Index

Takes into account numerous additional factors

- Margin of victory (with diminishing returns)

- Games where a team is missing key players

Shown to be much more accurate at predicting success

# Conference Rankings

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Need to evaluate conferences themselves

Teams play so many games within conference, it's hard to determine the difficulty across conferences

# Our Models

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Reweighting RPI

Conference Rankings, Conference Wins

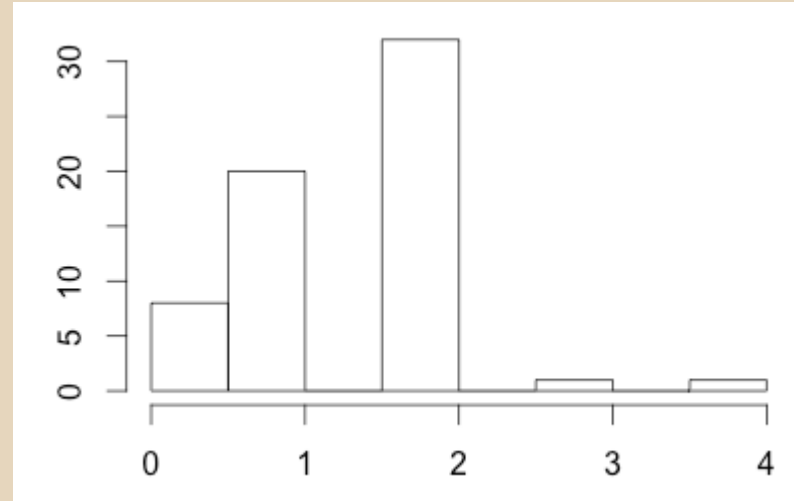
Pythagorean Theorem of Sports

# Baseline (using RPI)

Pvalue = 0.0004

$R^2 = .1823$

Distribution of Errors using RPI



# Reweighted RPI

Not much difference between weights

Best models weighted wins highly

Pvalues  $\ll .05$ ,  $R^2 = .187$

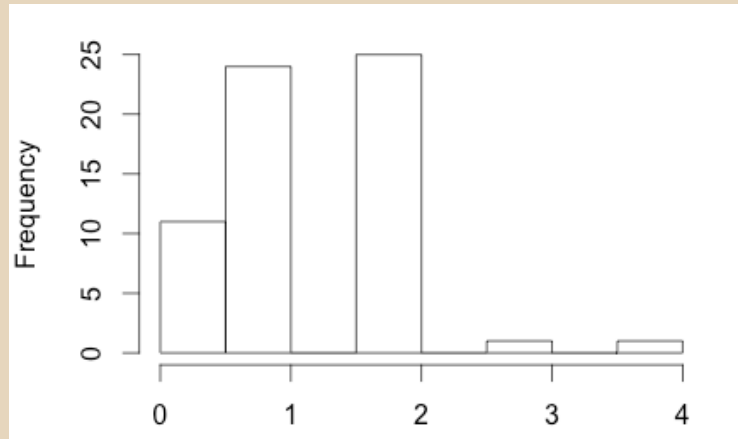


# Conference Ranking Model

Interactions between conference strength and conference wins

Pvalues = 0.0002,  $R^2 = .196$

Distribution of Errors using  
Conference Rankings



# Pythagorean Theorem for Sports

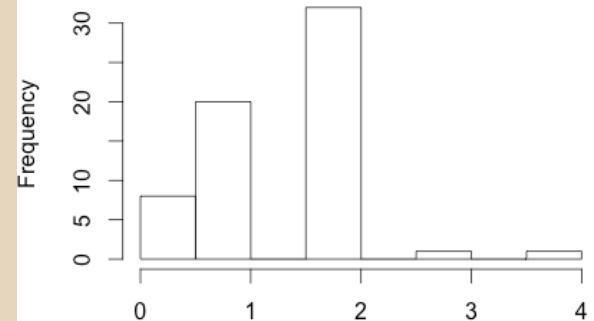
Team Points  $^2$  - Opponent Points  $^2$

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Team Points  $^2$

Pvalue = 0.0009,  $R^2 = .16$

Distribution of Errors using  
Pythagorean Theorem



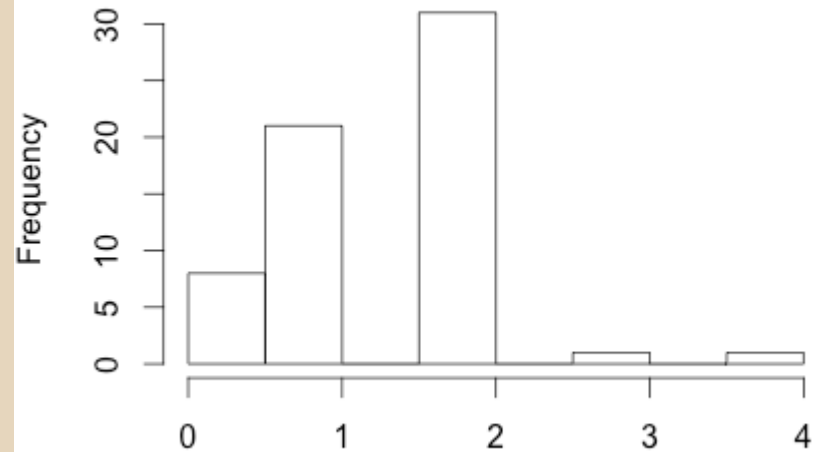
# BPI

ESPN's model

$R^2 = 0.2018$

Pvalue = 0.0002

Distribution of Errors using BPI



# Errors

Low  $R^2$

Data availability

Seeding

Weak conferences

# Questions?