

## Abstract

Success in the National Football League is often measured by wins in the regular season, playoffs, and Super Bowl. Spending funds wisely on players is one way NFL franchises attempt to create high and sustainable levels of success year after year. The purpose of this project was to better understand and inform spending decisions and team-building strategies to increase the chances of a team's success.

## Objectives

The following questions were posed:

- What are the most valuable positions in football?
- Which teams have spent resources well in the past?
- Which team has structured its spending the best for the upcoming 2023-2024 season?

## Data

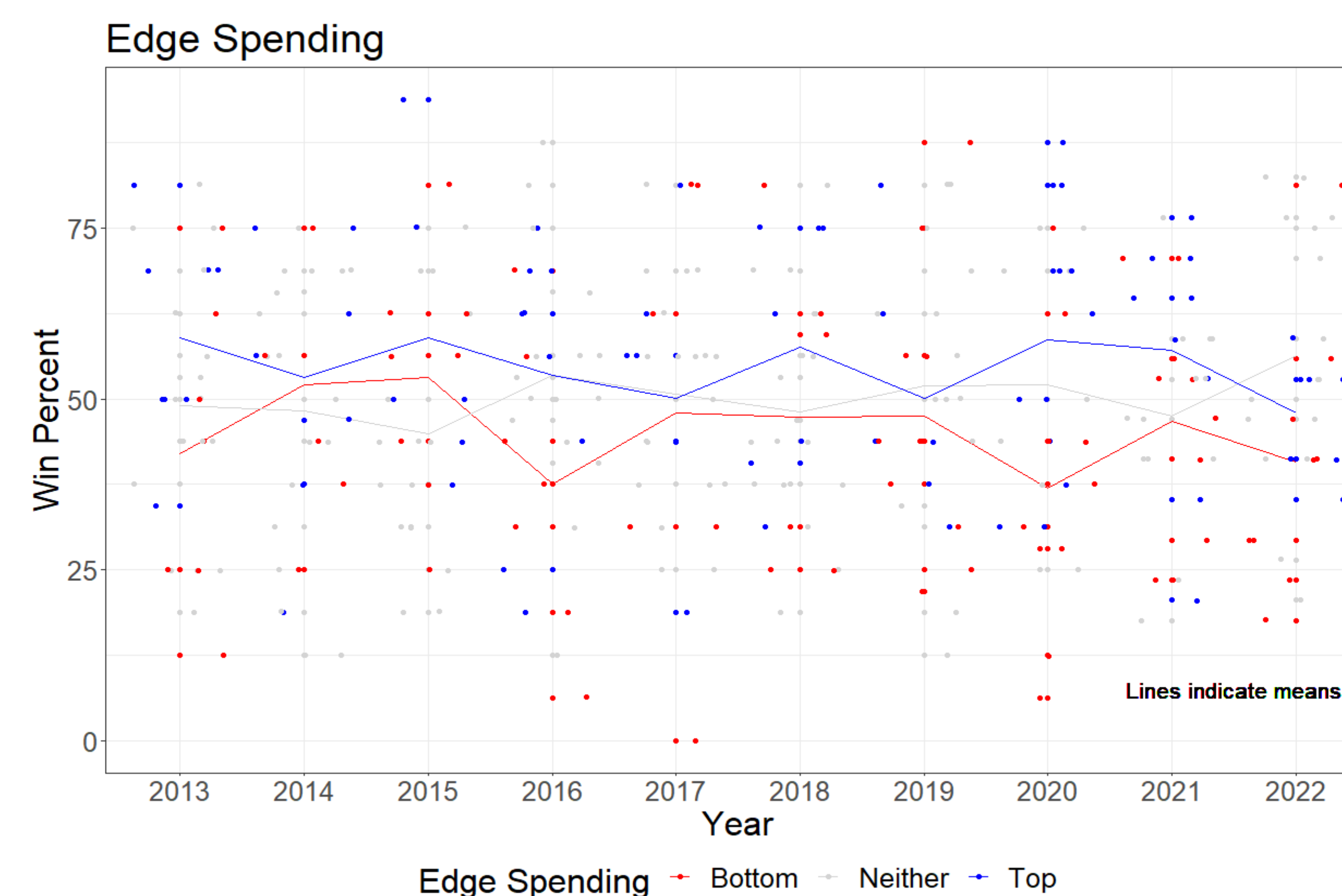
- NFL teams operate on a capped salary system. Teams may not spend more than the amount allotted by the league.
- The position groups considered were:
  - Quarterback (QB), Running back (RB), Wide receiver (WR), Tight end (TE), Offensive line (OL), Interior defensive line (IDL), Pass rusher (EDGE), Linebacker (LB), Safety (S), and Cornerback (CB).
- Spending by position was listed as a percentage of cap space spent.
- Spending data was sourced from overthecap.com. Season log data was sourced from nfl.com.

## Results

- A linear model was used to relate Win Percent and Spending Percent for each position group.

Position	Estimate	T Value	P-value
QB	0.88818	4.016	< 0.0001
RB	0.83058	1.771	0.0775
WR	0.50796	1.922	0.0556
TE	0.97032	2.072	0.0391
OL	0.45496	1.864	0.0632
IDL	0.47103	1.899	0.0585
EDGE	1.11996	4.835	< 0.0001
LB	0.79940	2.321	0.0209
S	1.50204	4.177	< 0.0001
CB	0.53938	2.121	0.0347

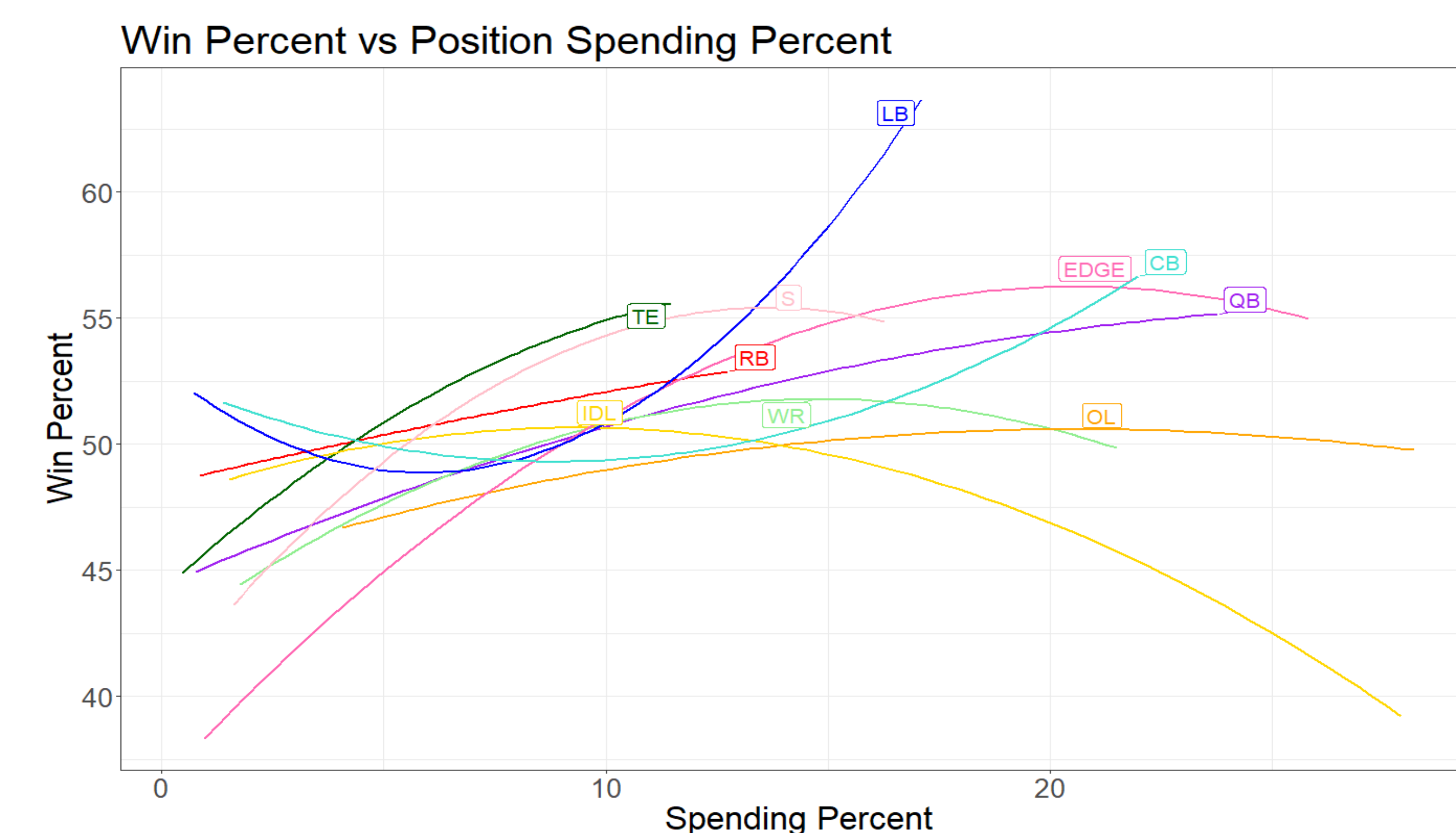
- The most valuable positions were EDGE, S, and QB according to significance.
- Teams were categorized as Top Spending, Bottom Spending, or Neither for each position group.



- Teams which were top spenders in EDGE performed better than teams which were bottom spenders.
- Similar plots show the value of QB and S.

## Results

- An optimal spending strategy was found using the maximum of each fitted line.



- Teams' spending histories were assessed by distance from the optimal strategy.
- Various weights for position importance were considered such as t value, standardized coefficient, and no weight.
- Teams that spent the wisest were:
  - 2013 Seahawks (13-3-0)
  - 2018 Vikings (8-7-1)
  - 2013 Vikings (5-10-1)
  - 2020 Chiefs (14-2-0)
  - 2021 Chiefs (12-5-0)

## Additional Notes

- The model was applied to spending data for the upcoming season. The team spending closest to the optimal strategy is the Cleveland Browns.
- Numbers fail to capture human impacts such as coaching and team chemistry.
- Worse-than-expected success is possible while still adhering to the strategy.

## Acknowledgements

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