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## **Project Proposal**

### *Research Question:*

Did the 2010 overtime rule change in the NFL affect the rate at which the “better team” wins in overtime?

We have two clarifications to the research question:

1. Before 2012, overtime could be won with any score - a touchdown, field goal, or safety. The 2012 overtime rule change in the NFL made it so that in any football game including the regular season, the first score can only be a touchdown to win the game.
2. “Better team” can be quantified in many different ways: point spread, touchdowns, point differentials, power rankings, win percentage, which will be decided later.

### *Motivation Behind Proposal:*

Overtime has been a pressing issue within NFL circles across the last few seasons. The Kansas City Chiefs’ defeat in the 2019 AFC Championship Game and the Atlanta Falcons’ loss in Super Bowl LI have raised questions over whether the best teams are winning overtime matches.

### *Study Design:*

We intend to perform a pre/post analysis before and after the overtime rule change to test whether the change impacts the likelihood of the “better” team winning the game. We aim to use two logit models with “overtime wins” as our dependent variable and “team strength” as our independent variable.

### *Data (Location and Schema):*

We are using data from pro football reference (<https://www.pro-football-reference.com/>), which allows us to pull data about regular season games and isolate overtime. It also lets us determine various measures of team quality (point differential, Vegas odds, points for/against).

Our data is split into two components, the period where overtime existed in a post-merger NFL to the 2012 rule change (1974-2012), and the period from the 2012 rule change to the next overtime rule change in 2017 (the shortening of overtime from 15 to 10 minutes). The 2012 rule change implemented the 2010 overtime laws into regular season play, so we have both not included playoffs for the study and split the data at the time of the 2012 change instead of 2010.

### *Competing Theories:*

The winning team could be determined primarily by randomness and not impacted by the relative strength of the two teams. Both situations could find the “better” team a significant percentage of the time but find no difference between the two. Finally, both could be significant and there could be a difference between the two. For example, the post-rule-change environment could involve the “better” team winning at a higher rate.

### *Potential Confounds:*

The “better team” might get better calls during overtime by the referees because of the subconscious expectation that they will perform better, which might skew overtime wins unnaturally in favor of the “better team.” Considering the amount of complaints directed against refereeing in the past couple years, it’s possible that referees play favorites in overtime matches.