**Introduction**

Before I started berating teams for not going-for-it, I had to make sure the numbers backed it up. After checking out the mean Expected Points Added (EPA) for punting vs going-for-it on various field positions, I could zoom in on specific field positions with the most value lost. After that a random forest algorithm was applied based on time left in the game, field position, yards to the first down, whether it was a goal-to-go situation, and score differential to illuminate the factors that cause these erroneous decisions.

**EPA on Punting vs Going-For-It**

A close up of a map

Description automatically generated

* The graph starts at the opponent 35-yard line as that’s about as close as a team can get while still considering punting
* As you can see the EPA of punting doesn’t become more valuable than going-for-it until a team is on their own 43-yard line. Even then it fluctuates a little bit and never becomes a definitely more valuable decision
* After checking out this info, I decided to zoom in on the 35 – 50 yard line as that shows a significant amount of lost value

**Effects of Poor Value-Based Decisions**

* The difference between EPA on punts vs going-for-it is at its most stark between the 50-yard line and the opponents 35-yard line. This is an area that is bordering on too long to kick a field goal (57.5% success rate on kicks over 52 yards), but the field position gains of a punt aren’t enough to justify a punt.
* Going-For-It in this range has an EPA of .0484
* Punting in this range has an EPA of -0.5584
* A team will gain on average an additional 0.6 points by going-for-it instead of punting in this field position
* Despite this, NFL teams only went-for-it on 23.3% of 4th downs in this field position
* Now that the inefficiency has been made clear, it’s time to zoom in on the factors that go into these decisions

**Root Causes of Poor Decisions in the “Deadzone”**

A screenshot of a cell phone

Description automatically generated

* The random forest algorithm can output the “weights” of the different factors based on the decision tree built
* Above is a graph of the respective weights for the algorithm, which has an accuracy of 85%
* Since we know that going for it is the more efficient move, and coaches only go for it on 23.3% of 4th downs in the deadzone, these factors will illuminate the factors that feed into these \*incorrect\* decisions
* Score Differential
  + Carries over 40% of the weight
  + Teams down are more willing to go-for-it, while teams winning are likely to shy away from it
  + I was once told “Always play like the score is 0-0”. While this is just a saying, NFL coaches would be wise to follow this advice. The data shows they are allowing score differential to get in the way of improving their chances to score points
  + While it sounds rudimentary to say, scoring as many points as possible should always be the primary objective. Remember the Texans being up 21-0 on the Chiefs in the 2020 Divisional Round? The Texans then kicked a field goal instead of going-for-it, and the Chiefs proceeded to score 41 straight en route to a comeback. Do not rest on a lead, every point counts
* Time Left in Game
  + Accounts for ~25% of the decision
  + This is where \*some\* slack can be given to coaches
  + Up multiple scores, late in the game, with the score out of reach, it can make sense to punt
  + The issue that arises in this section is that coaches will wait until late in the game to start being more “aggressive” and go-for-it
  + In reality then should be attempting to score as many points by going-for-it in the deadzone in every part of the game, not just the 4th quarter
* Yards to First Down
  + Accounts for ~ 18% of the decision
  + Teams are naturally more willing to go-for-it when there’s less distance until a first down, which makes sense
  + However, the data points to a 4th and long still attempt still being more valuable than a punt in the deadzone
  + In 4th down situations with 5+ yards to go you still gain 0.34 points of EPA by going-for-it vs punting in this zone of the field
* Distance to Goal Line
  + Accounts for ~15% of the decision
  + As pointed out earlier every spot in this zone is significantly more valuable to go-for-it so any influence of this factor can be chalked up to error on the coaches’ part