

Risky Business Week 12

What Really Happened to the Onside Kick?

Beginning in 2018, the NFL implemented a rule change that limited a kicking team from loading one side of the ball and also prohibited the players from getting a running start. This was presumably done for player safety and was immediately perceived as a rule that would reduce the effectiveness of onside kicks. Beginning in 2011, when the kickoff was moved to the 35 yard line, we can examine how onside kicking behavior has changed as a result of the 2018 rule change. For simplicity we have divided the kicks into the 1st 3 quarters (surprise) and 4th quarter (expected). This approach does not capture all of the separation between surprise and expected onside kicks but should serve as a reasonable approximation.

Average Onside Kick attempts per Year:

PERIOD	1 ST 3 QUARTERS	4 TH QUARTER
2011 - 2017	9.4	53.9
2018 – Present*	4.5	58.5

*2020 data is extrapolated from week 12

Surprisingly, the rate has increased slightly for desperation (4th quarter) onside kicks which are generally expected by the receiving team. Not so surprisingly, the rate of surprise onside kicks has gone down significantly although it was rarely used in the first place. What about the recovery rates during this same time period?

Onside Kick Recovery Rates (with statistical uncertainties of +/- 1 standard deviation):

PERIOD	1 ST 3 QUARTERS	4 TH QUARTER
2011 -2017	45.5% (+/- 6.1%)	10.3% (+/- 1.6%)
2018 – Present	16.7% (+/- 10.8%)	8.4% (+/- 2.2%)

Both time periods show a significant premium to the surprise (1st 3 quarters) onside kick. It also appears the recovery rate for onside kicks of both varieties was reduced by the 2018 rule change. Armed with this information, let's examine how a kicking strategy can be assessed in 2020. An excellent example occurred this Sunday in Cincinnati.

With 2:33 remaining in the game, the Bengals were kicking off to the Giants with a 19-17 deficit and just one time out. The Giants receiving team was keenly aware of the possibility of an onside kick attempt, but the Bengals instead chose to kick deep. Dion Lewis appeared willing to let it go into the endzone for a touchback but an unfortunate bounce at the 2 yard line forced him to attempt a return. He was able to secure a less than ideal starting position for the Giants offense at the 13 yard line. This was certainly more favorable than a touchback for the

Bengals, and after a three and out by the Giants they found themselves at midfield with 57 seconds to score a game winning field goal. Unfortunately, a sack of Brandon Allen on first down and fumble recovery by the Giants' Jabaal Sheard sealed the Bengals' fate.

In order to assess the viability of an onside kick attempt we will look at two separate scenarios of a touchback and the actual kick that resulted in the Giants beginning their drive at the 13 yard line. We will also operate on the assumption that both a successful and unsuccessful onside kick will advance the ball 10 yards and the clock 5 seconds. The required recovery rate can be determined by understanding the Bengals' GWC from the relevant game states per the EdjSports' simulation model.

- Bengals recover onside kick on their own 45 yard line: **Bengals' GWC = 61.7%**
- Giants secure onside kick on Bengals' 45 yard line: **Bengals' GWC = 7.9%**
- Bengals kick touchback and Giants start on their 25 yard line: **Bengals' GWC = 10.9%**
- Giants return the ball to 13 yard line (actual scenario): **Bengals' GWC = 15.1%**

Bengals' required onside kick recovery rate assuming touchback on normal kickoff:

- Risk: $10.9\% - 7.9\% = 3.0\%$
- Reward: $61.7\% - 10.9\% = 50.8\%$
- $3.0 / (50.8 + 3.0) = \mathbf{5.6\% \text{ required recovery rate}}$

Bengals' required onside kick recovery rate assuming actual kick (13 yard line):

- Risk: $15.1\% - 7.9\% = 7.2\%$
- Reward: $61.7\% - 15.1\% = 46.6\%$
- $7.2 / (46.6 + 7.2) = \mathbf{13.0\% \text{ required recovery rate}}$

With the best estimate of an NFL average recovery rate since 2018 at 8.4%, it appears the Bengals made a mistake by kicking deep if a touchback occurs, but gain in the actual scenario. We can also determine the breakeven net yardage of a deep kick compared to the NFL average (expected) onside kick recovery rate of 8.4%. That turns out to be the 20 yard line. Although the Bengals managed to surpass that threshold on Sunday, it is a pretty tall order. The average expected starting position for the receiving team on a deep kick is approximately the 26 yard line.

The Bengals could argue their strategy was correct as it ultimately put them in a winnable position at midfield with 57 seconds remaining. Their GWC at that point was 63.1% which was even more favorable than a recovered onside kick (61.7%). However, that would be cherry-picking the results. We can only assess their kicking strategy based on the best information at the point of decision, and in this case, we have to charge them with an error.

